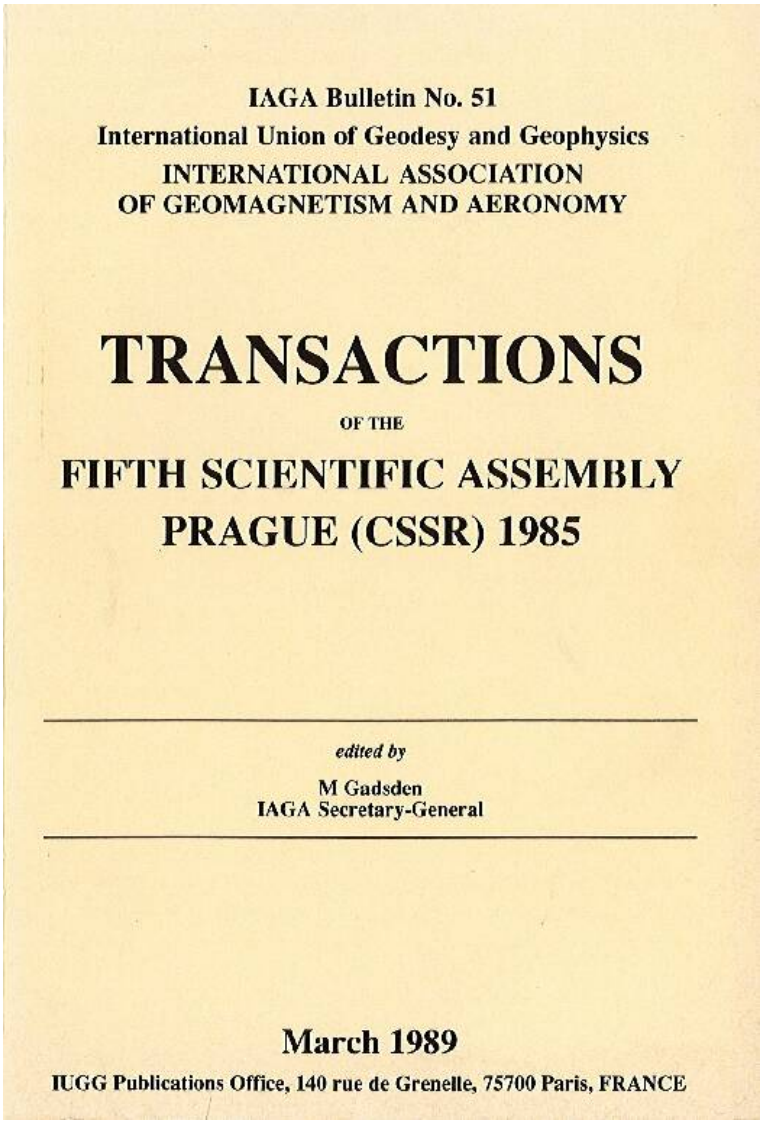

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IAGA Bulletin No. 51
International Union of Geodesy and Geophysics
INTERNATIONAL ASSOCIATION
OF GEOMAGNETISM AND AERONOMY

TRANSACTIONS

OF THE

FIFTH SCIENTIFIC ASSEMBLY
PRAGUE (CSSR) 1985

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edited by

M Gadsden
IAGA Secretary-General

March 1989

IUGG Publications Office, 140 rue de Grenelle, 75700 Paris, FRANCE

IAGA Bulletin No.51

TRANSACTIONS OF THE FIFTH SCIENTIFIC ASSEMBLY
5-17 August, 1985
Prague (CSSR)

ACKNOWLEDGEMENTS

The Fifth Scientific Assembly was held in Prague, in the heart of Bohemian Czechoslovakia. The principal debt of gratitude is owing to Professor Vaclav Bucha who, as Director of the Geophysical Institute, took the initiative in organizing and running the Assembly. He worked with the willing band of helpers listed below, in alphabetical order, and to whom the grateful thanks of all participants are due:

Ivan Cupal
Valdimir Kropacek
Jan Lastovicka
Milada Moravcova
Oldrich Praus
Hana Prochazkova
Pavel Triska
Vojtech Velicky
Tomas Zelinka

[They, and all Czechoslovak colleagues, must accept the apologies of a Secretary-General whose daisy-wheel printer does not allow for the rich and exciting array of accents available for use in Czechoslovakian names.]

Thanks are due too to Mr M Poliak, Deputy Mayor of the capital city, Academician J Nemec, Czechoslovak Academy of Sciences, and Dr J Obzina, Vice Premier of the Czechoslovak Federal Government, who bade the participants welcome at the opening ceremony of the Assembly.

IAGA was particularly pleased to welcome as joint participants in the Assembly colleagues from the International Association of Meteorology and Atmospheric Physics, particularly those in the International Commissions on Meteorology of the Upper Atmosphere and on Radiation. Their sessions were held concurrently with IAGA sessions, on an equal footing as very welcome co-organizers of the Assembly.

This issue of "Transactions" is being sent to all registrants and appears tardily upon the scene. All responsibility for this delay, for errors and omissions, lies with the Secretary-General of IAGA -

Michael Gadsden

Michael Gadsden

INVITATION

to the opening ceremony and festive concert
in the Smetana Hall of the Municipal House at 7.00 p.m.,
Aug. 5, 1985
held on the occasion of the Fifth Scientific Assembly of IAGA
jointly with two IAMAP Commissions

under the auspices of

Vice-Premier of the Czechoslovak Federal Government
Jaromír OBZINA

Fifth Scientific Assembly IAGA/IAMAP is organised under
honorary chairmanship of

Mayor of the Capital of Prague
František ŠTAFA

President of the Czechoslovak Academy of Sciences
Bohumil KVASIL

Chairman of the Central Bureau of Geodesy and Cartography
František KOUBEK

Chairman of the Czech Bureau of Geology
Josef PRAVDA

Vice-Presidents of the Czechoslovak Academy of Sciences
Přemysl RYŠ and Vladimír POKORNÝ

Director of National Enterprise Geofysika
Jaroslav IBRMAJER

ADDRESS OF WELCOME BY VICE-PREMIER DR JAROMIR OBZINA

Pane prezidente,
dámy a pánové,
soudružky a soudruzi,

dovolte, abych Vás jménem vlády ČSSR srdečně uvítal v hlavním městě naší vlasti Praze na jednání 5. vědeckého asamblé Mezinárodních associací pro geomagnetismus a aeronomii, pro meteorologii a fyziku atmosféry a popřál Vám mnoho úspěchů ve Vaší práci. Je to podruhé, kdy se vědci Mezinárodní unie geodetické a geofyzikální setkávají v Praze. V roce 1927 se konalo v Československu třetí generální asamblé celé unie, jehož významným organizátorem byl tehdejší ředitel Státního ústavu geofyzikálního profesor Bedřich Šalamon. Jednání se účastnilo asi 30 zahraničních vědců. Dnes se schází v hlavním městě socialistického Československa takřka 1000 vědců z oboru geofyziky a částečně z oboru meteorologie. Pociťujeme upřímnou radost a uspokojení z rozvíjející se mezinárodní vědecké spolupráce i z jejích úspěchů.

Geofyzika patří k těm vědním oborům, jejichž rozvoj není prakticky možný bez široké mezinárodní spolupráce vědců z celého světa. Úspěšná mezinárodní spolupráce však nezbytně vyžaduje mírové podmínky života národů a mírovou politiku jejich vlád. Vláda ČSSR se opět bezvýhradně i dnes přihlašuje k závěrům 1. zvláštního valného shromáždění OSN, zabývajícího se problematikou odzbrojení, které se konalo v roce 1978. Na tomto valném shromáždění bylo slavnostně proklamováno, že "lidstvo má na vybranou, buď zastavit horečné zbrojení a pokročit v odzbrojení, nebo čelit úplnému zničení". Vláda ČSSR je důsledným stoupencem mírové politiky přátelství a spolupráce mezi národy, je rozhodným odpůrcem růstu zbrojení, válečných příprav vůbec a termojaderné katastrofy zvláště. Jako země s 15,5 miliónů obyvatel ležící v srdci Evropy máme právo a povinnost mírovou politiku provádět a obhajovat. Nemůžeme proto bez povšimnutí přehlížet snahy jakýchkoli militaristických sil zneužívat poznatků vědy k ohrožování celé lidské civilizace a k militarizaci kosmu zvláště.

Na druhé straně s upřímnou radostí jsme před 10 lety přivítali Helsinskou konferenci a nyní při příležitosti jejího desátého výročí všechny mírové hlasy a především skutky. Mezi nimi na prvém místě především oceňujeme oficiální závazek Sovětského svazu od zítřejšího dne, tj. od 6. srpna 1985 "jednostranně zastavit veškeré jaderné výbuchy". Věříme, že tento projev dobré vůle a odpovědnosti dnes nebo zítra najde své následovníky. Upřímně si přejeme a vyjadřujeme své hluboké přesvědčení, že vědci celého světa mohou významně přispět svou iniciativou a odpovědností k mírovému úsilí. Věříme, že tomuto vznešenému poslání světové vědecké obce bude sloužit i Vaše jednání. Vždyť je dnes obecně známou skutečností, že vědecký pokrok dosáhl takového stupně a úrovně, že překážkou pro uzavření dohody o všeobecném zákazu zkoušek jaderných zbraní, ale i zákazu a likvidaci chemických a biologických zbraní není nepřipravenost technických prostředků nebo účinných spolehlivých verifikačních systémů, ale pouze nedostatek politické vůle, realismu a odpovědnosti určitých politických a vládních kruhů. Je třeba zdůraznit, že geofyzika svým poznáním významně přispívá

k mírovému využití atomové energie, např. určováním seismického ohrožení vybraných staveb, stejně tak jako nemalou měrou přispívá k zabezpečení požadavků na tvorbu a ochranu životního prostředí a racionálnímu využívání přírodních zdrojů.

Pane prezidente,
dámy a pánové,
soudružky a soudruzi,

vědní obory a disciplíny, jejichž mezinárodnímu rozvoji je věnován náš kongres, představují významnou složku našich státních plánů základního výzkumu a jejich praktické aplikace. Prováděná geomagnetická mapování nám poskytují jednak přesný obraz o rozložení geomagnetického a elektromagnetického pole na našem území, jednak pomáhají vymezovat anomální oblasti vyžadující podrobným výzkum. Na základě těchto poznatků jsme ve vybraných lokalitách získali podklady umožňující jejich využití v naftovém průzkumu se slibnými perspektivami.

Dále rozbor charakteristik proměnného pole vedl k vytvoření globálních a regionálních modelů vnitřní geoelektrické stavby. K důležitým geofyzikálním charakteristikám našeho státního území patří zóny geoelektrických nehomogenit, které jsou vymezené z výsledků pozorování a analýz proměnného geomagnetického pole. Tyto výsledky, jakož i modely vnitřní geoelektrické stavby též orientují naši pozornost k oblastem, které mohou být perspektivní z hlediska zdrojů surovin a současně nám poskytují další fakta pro rozvíjení nových geologických koncepcí vývoje a hlubinné stavby na našem území.

Naše vláda oceňuje výsledky této vědecké a výzkumné činnosti a všestranně je podněcuje.

V mezinárodním životě se čs. vědci aktivně podílejí na celé řadě mezinárodních vědeckých programů zaměřených na studium zemské magnetosféry, ionosféry a střední atmosféry. Aktivně se účastnili Mezinárodního geofyzikálního roku a na něj navazující celé řady mezinárodních vědeckých projektů a programů, jako Mezinárodního roku klidného slunce, Roku aktivního slunce, Mezinárodního výzkumu magnetosféry Země a mnoha dalších programů a projektů souvisejících s růstem zájmu o problematiku změn klimatu a počasí i jejich vlivů na rostlinnou zemědělskou produkci především, dále na energetiku a na zásoby vod.

Konkrétně dovolte připomenout, že čs. geofyzikové, podobně jako vědci z řady jiných oborů, se aktivně účastní na Programu spolupráce socialistických zemí při výzkumu a mírovém využívání kosmického prostoru, na programu, který zkráceně nazýváme Interkosmos. Jde o rozsáhlý program, který přinesl již řadu úspěšných experimentů a nových teoretických poznatků. V rámci tohoto programu bylo vypuštěno již 25 družic, řada geofyzikálních a meteorologických raket, uskutečnily se výzkumné programy na kosmických sondách na palubách sovětských orbitálních laboratoří "Soljut" a proběhla řada vědeckých experimentů, které uskutečnily jejich mezinárodní posádky. Pro nás je významný především let uskutečněný před 7 lety s účastí prvního československého kosmonauta Vladimíra Remka. Upřímně se radujeme z možnosti aktivně a účinně se podílet na mezinárodní spolupráci v kosmickém výzkumu. Vždyť uplynulé kosmické čtvrtstoletí

je pro lidstvo a pro světovou vědeckou obec zvláštním a cenným obdobím:

1. pro geofyziku je kosmická technika prostředkem výzkumné práce novými metodami, novou metodikou;

2. celé vědě dala kosmická éra nebývalé možnosti aktivní účastí člověka v kosmu, využíváním výsledků všech typů družic - meteorologických, spojových, družicových navigačních systémů, rozvoje metod dálkového průzkumu Země a jejích zdrojů a řadu dalších;

3. všemu lidstvu dala kosmická éra nové představy o naší planetě a kosmu a vnesla do vědomí lidí, do jejich světového názoru nové způsoby myšlení, nové vědecké, etické a politické hodnoty, nové lidské hodnoty.

Znovu proto opakuji, nemůžeme se jako lidé - vědci, političtí činitelé smiřovat, či dokonce smířit s myšlenkou militarizace kosmu, a proto ji důrazně odsuzujeme a proti takovým záměrům před tváří celého lidstva protestujeme, neboť máme rádi svou vlast, máme rádi život na Zemi, naši krásnou modrou planetu, kterou si my, lidé, ve vlastním zájmu musíme a budeme bránit.

Pane prezidente,
dámy a pánové,
soudružky a soudruzi,

ještě jednou Vás všechny jménem vlády ČSSR co nejsrdečněji u nás vítám a dovolte mi vyjádřit přesvědčení, že Vaše setkání vědců z celého světa se stane vědeckým přínosem do světové pokladnice znalostí a kultury a současně příspěvkem k upevnění přátelství mezi národy, a že poslouží světovému míru.

Přeji Vašemu jednání mnoho zdaru!

Bedřich Smetana

MY COUNTRY

Cycle of Symphonic Poems

Vyšehrad
Vltava
Šárka

From Bohemia's Woods and Fields
Tábor
Blaník

West-Bohemian Symphonic Orchestra
Conductor: Stanislav Bogunia

My Country, a cycle of six symphonic poems, is a unique work of Czech culture, which on the background formed by the Czech countryside comprises samples of the Czech myth, old legends and tales, reminders of the most illustrious times in Czech history. It is a reflection of the artist's warm relation towards the Czech nation and country, and at the same time of his musical genius.

Smetana solved the problem of the structure and gradation of the work as a whole in a brilliant manner, using common musical forms. Thus, »Vyšehrad« has an almost classical sonata form and »Vltava« the form of a developed rondo, »Šárka« is a purely epical and balladic work, while »From Bohemia's Woods and Fields« is a lyrical poem making use of free polyphony, »Tábor« is a monothematic composition with the use of variations, while »Blaník« is a rich summary of everything, fulfilling the function of a magnificent finale. Purely musical media are used with great virtuosity, the principles of contrast and constant gradation being adhered to. The composer's poetic ideas are naturally combined with the laws of musical composition in a manner only a great musician and a great poet in one person could achieve.

Vyšehrad. The harps of bards begin being followed by the song about the history of the castle, its glory, glitter, tournaments, battles and its final fall into ruin. The work ends on an elegiac note.

Vltava. This poem describes the course of the Vltava River, in a way being an allegory of life. It is a series of events as they sucessively occur on its way from its two sources as far as the mighty stream, which mirrors Vyšehrad before dis-

appearing in the distance (Hunters' fanfare, merry country feasts, the moon water-sprites dance, St. John's currents, etc.)

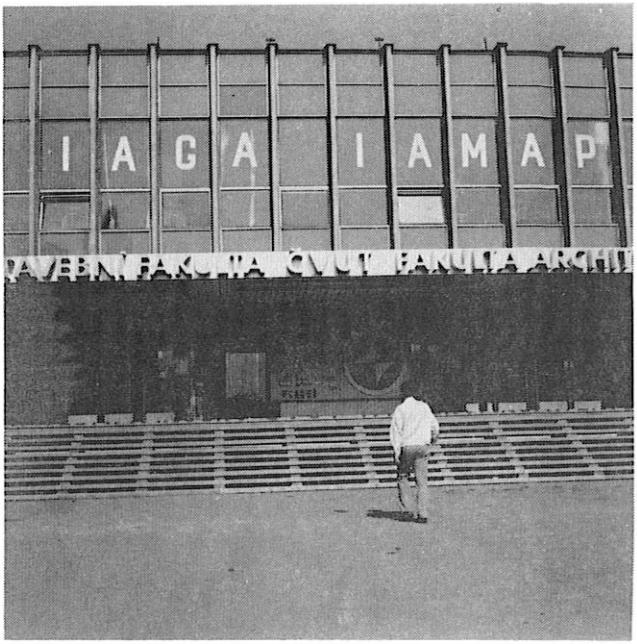
Šárka. The poem is based on the tale of an angry maiden and her revenge on the whole male sex for the infidelity of her lover. It is a story of individual human relationships full of love and hate, cruelty and erotic elation.

◇ ◇ ◇ ◇

From Bohemia's Woods and Fields. This poem is a general portrayal of the feelings evoked by the Bohemian landscape. Passionate melody rings out from all sides, sometimes gay, sometimes melancholy. Forest scenery — in the solo horns — and the gay, fertile lowlands of the Elbe River, and other places are all celebrated in this part of the cycle.

Tábor. The work depicts strong will, victorious battles, endurance and stuborn unyiedingness of the Hussites. It is a glorification of a historic epoch and an ancient choral.

Blaník is a continuation of the previous work. The legendary mountain in South Bohemia provides shellter to the warriors, who are waiting for the moment they are to come to the aid of their country. In its individual parts, the music captures the sleeping warriors, the scenery of the Blaník region and the coming and growing danger. In the form of a march, the triumphal choral concludes the work symbolizing the strength of the nation.


I A G A I A M A P


IACA IAMAP

5TH SCIENTIFIC ASSEMBLY

Prague (Czechoslovakia)

MINUTES OF THE
CONFERENCE OF DELEGATES

5 August 1985; 0930h
16 August 1985; 1400h

1. Introduction

In the absence of President Gough, Vice President Gendrin took the Chair and, after the Secretary-General notified that a quorum of Chief Delegates [see page 10] was present, he opened the meeting in this wise:

"Our President, Professor Ian Gough from the University of Alberta (Canada), has been unable to attend the very first session of this 5th Scientific Assembly in Prague, which is also the place where two IAMAP Commissions are holding their Assembly, in close connection with our Division II on Aeronomic Phenomena and InterDivision Commission on Middle Atmosphere Program.

On behalf of him I welcome all scientists from both Associations in this city.

President Gough was on duty, for the last three days, in order to represent IAGA at the Executive Committee of IUGG in Hawaii. He had to discuss the IAGA budget (and I'm sure he did that forcefully) and the program of our Association at the next IUGG Assembly in Vancouver (August 1987). He will arrive this afternoon and will be present at the Opening Ceremony this evening.

President Gough asked me to preside at this first meeting of the Conference of Delegates. In doing so, he reminded me of two acknowledgments that have to be done.

The first one is to express our gratitude to the Academy of Science of Czechoslovakia, to the Local Organizing Committee [LOC] and to your Vice President, Professor Vaclav Bucha, to have invited us in this very old place, where the first University of Central Europe was created, and to have organized with such efficiency and aimiability what will be I'm sure a very lively and productive Scientific Assembly.

In a few minutes, Vaclav Bucha will present to you his welcome address and I'm sure you'll express to him and to his colleagues your gratitude for the work they have done for the success of this Assembly.

The second message I have to convey is towards your Secretary General, Professor Michael Gadsden from the University of Aberdeen, for the enormous work he has done in organizing the

material for this Assembly, notwithstanding the absence of response of dreaming scientists or convenors. He did it in a very efficient way, in a computerized manner. But I'm sure that you have smelt within the page of our booklets the fragrance of the Scottish thistle and humour.

By having transmitted these two messages, I'll give the floor to Vice President Bucha for his welcome address and then to the Secretary General for the presentation of the administrative matters."

Vice President Bucha, on behalf of the Academy, welcomed the Delegates to the Assembly and presented his best wishes, coupled with good wishes from the staff of the Geophysical Institute, for an effective and successfaul meeting.

2. Minutes of the previous meeting

The minutes of the meetings of the Conference of Delegates in Hamburg (during the XVIIIth General Assembly of IUGG) have been printed in IAGA News No 22, pages 4-15. These were adopted as correct nem con.

3. Matters arising from the Minutes

None.

4. Report by the Secretary-General

a) The Executive Committee has met once since the last Conference of Delegates in 1983. This meeting was held in September of last year and the draft minutes of that meeting have been published in full in IAGA News No 23, pages 43-50.

The Executive Committee has granted IAGA sponsorship to six meetings:

1. Comparative Study of Magnetospheric Systems. September 1985 (France).
2. International Workshop on Data Processing. March 1985 (India).
3. Polar Geomagnetic Phenomena Symposium. May 1986 (USSR).
4. The First GLOBMET symposium. August 1985 (USSR).
5. Workshop on Geomagnetic Observatories, Surveys and Repeat Stations. Spring/Summer 1986 (Canada).
6. The Eighth Workshop on Electromagnetic Induction. August 1986 (Switzerland).

The question of reorganization of the InterDivisional Commission structure was raised before the Executive Committee at its meeting in 1984. The IAGA Leaders have been consulted on this and the matter will be a subject for continuing discussion during this Assembly.

Your Executive Committee has scheduled meetings for lunchtime on Thursday this week, and the evenings of Monday and Thursday of next week. There is to be an all-day meeting on the Saturday after the close of the Assembly. Any matters a Delegate wishes to have brought before the Committee should be notified to me at any time in the next twelve days.

Now, some administrative details for this Assembly: first, this is a Scientific Assembly. (There is a misprint on the covers of the Abstract Books which was not caught until after printing!)

Resolutions for consideration for the final meeting of the Conference of Delegates should be channelled into my office through a Divisional or InterDivisional Commission Business Meeting or through your Chief Delegate. Please may I ask that these Resolutions be passed to me no later than the day after the Business Meeting? This is particularly important for the InterDivisional Commission for Developing Countries which does not hold its Business Meeting until Wednesday of the second week, and for Divisions III and V and InterDivisional Commission on History which meet on the Tuesday.

Let me mention the day-to-day programmes of the sessions. As often happens, there will be last-minute alterations of papers withdrawn, extra papers, and some shuffling of the order of papers. Each half-day session has had its most up-to-date programme printed on a poster-size sheet and the final programme will be placed on the main noticeboard (just by the registration area) approximately 24 hours before the session. A second poster copy will be put on the door of the room in which the session is being held.

Please, therefore, will each convenor or chairman bring to my office the final details of timing and order no later than the day before the meeting and we can settle the final display together.

I have been asked to bring to your attention that sessions 01.02 and 01.10 will start this morning at 1100h.

Two unimportant but significant points: first, all the clocks in this building are exactly correct twice a day. Secondly, Rooms 11 and 12 have been interchanged and to avoid confusion I understand that Room 11 is now labelled "12" and Room 12 "11"!

Finally, Mr President and Delegates, I beg to inform you with regret that I have received notification in the last two years of the death of seven IAGA scientists:

E G Forbes
E Lauter
R Maeda
S McWilliams
S Matsushita
R S Narcisi
J F Noxon

Vice President Gendrin asked the Delegates to stand in silence in memory of these colleagues and as a sign of sorrow at the loss to the IAGA community.

5. Honorary Membership

Vice President Gendrin noted that the last matter to take a decision on at this first meeting of the Conference of Delegates is award of Honorary Membership to Dr Valeria Alexeevna Troitskaya. He said: "The principle of such an award was adopted at the Edinburgh Scientific Assembly and six distinguished scientists have been already awarded. These are

Drs Alldredge
Cardus
Coulomb
Laursen
Nagata
Nicolet

The merits of Valeria Troitskaya do not need to be described. All of you know, for one reason or another, the importance of her scientific work and the efforts she has spent in order to make our Association a living and friendly one. Her attempt to establish and to reinforce international cooperation in a discipline where it is eagerly needed cannot be overemphasized. Later this week, President Gough will remind you more about her merits. But in the meantime I formally have to ask the Conference of Delegates if any official members has an objection against this proposal." [There being none, the Vice President continued:] "If not, I declare Mrs Valeria Alexeevna Troitskaya an Honorary Member of our Association." [Applause]

Vice President Gendrin then adjourned the meeting at 0953h until Friday, 16 August, at 1400h.

.....

In the evening of Monday, 5 August, the Opening Ceremony and Festive Concert took place at 1900h in the Smetana Hall of the Municipal House.

Dr Jaromir Obzina, Vice-Premier of the Czechoslovak Federal Government, opened with a speech of welcome to the Delegates on behalf of the Government of Czechoslovakia. This was followed by speeches of welcome from representatives of the City of Prague (Vice Mayor Poliak) and of the Czechoslovak Academy of Sciences (Mr Nemec). President Gough, who had arrived not long before from Honolulu, responded to these speeches and expressed, on behalf of the Delegates present, our grateful thanks and appreciation of the sentiments expressed by the preceeding speakers.

The Festive Concert followed, and was given by the West-Bohemian Symphony Orchestra (conductor: Stanislav Bogunia). The entire cycle of symphonic poems, "Ma Vlast" [My Country], by Bedrich Smetana was performed to rapturous applause.

Friday, 16 August, 1400h:

At the appointed time, the Conference of Delegates reconvened, President Ian Gough in the Chair.

7. Report of the Executive Committee

The President announced that the first circular of the XIXth General Assembly of IUGG in 1987 was now available from:

Conference Secretariat
Venue West
#801-750 Jervis Street
Vancouver British Columbia
CANADA V6E 2A9

and that a few copies had been made available at this Assembly.

The Secretary-General reported on discussions concerning the future of the International Service of Geomagnetic Indices. Following the decision by the Koninklijk Nederlands Meteorologisch Instituut to cease support of this Service from the end of 1986, an ad hoc committee had been convened to advise the Executive Committee. The Executive Committee subsequently accepted without demur the recommendations of the ad hoc committee and decided to advise Professor Melchior (President of the Federation of Astronomical and Geophysical Services) that four separate institutions would be looking into the practicalities of operating the International Service of Geomagnetic Indices and would report direct to him within two months.

J O Cardus proposed (seconded by R Hide) the following resolution, which was passed unanimously:

IAGA places on record its appreciation of the services rendered to geomagnetism by the staff of the Koninklijk Nederlands Meteorologisch Instituut in producing, over many years, annual reports for the International Service of Geomagnetic Indices (published as IAGA Bulletins No 32) and other occasional collections of particular geomagnetic data and indices and thanks the KNMI for these services.

Vice President Gendrin reported on the discussion concerning the adjacent and overlapping areas of interest of Divisions III and IV. [See the Executive Committee minutes, on pages 25-26.]

The President reported on the discussions concerning the future of the InterDivisional Commissions. [See the Executive Committee minutes, on pages 26-27.] The Executive Committee had resolved to recommend to National Bodies changes in ByLaw 1 to give effect to alteration in the status of InterDivisional Commissions. He emphasized that these changes preserved the groups within the scientific community of the Association while their scientific sessions were integrated into the scientific sessions of the Divisions. He pointed out that an InterDivisional Working Group worked through two or more Divisions. W D Parkinson asked if

these Divisions were to be specified and the President replied that normally this would be the case but the arrangement would be both flexible and variable. W H Campbell spoke on behalf of D E Winch, Chairman of the External/Internal Geomagnetic Relations InterDivisional Commission; he said that the InterDivisional Commission was part of the original restructuring of the Association and had continued to be an active, forceful and meaningful part of the Association. The President commented that the changes, if approved by vote of the Chief Delegates at the Vancouver Assembly, would simply ask the members of the InterDivisional Commission to work in future more closely though the Divisions. R Hide asked if a change in the status of the History InterDivisional Commission was contemplated. The President replied that no change was in prospect for either the History or the Developing Countries InterDivisional Commissions both of which had been regarded as special cases.

9. Resolutions

Vice President Gendrin, chairman of the Resolutions Committee (J Allen, E Kazmirovsky and C Sucksdorff) reported that twentyfive resolutions had been received by the Committee and he introduced nine resolutions which had emerged from the Committee's deliberations for recommendation to the Conference of Delegates:

SPECIAL PROJECTS

1. Magnetic satellite
   Seconded by M W McElhinny; Passed by overwhelming majority (2 opposed).

2. Solar Wind Satellite
   Seconded by A Nishida; Passed nem con.

3. Participation in the International Lithosphere Programme sur la Lithosphere]
   Seconded by M W McElhinny; Passed nem con.

4. Encouragement for the ILONEM Project
   Seconded by M W McElhinny; Passed nem con.

5. Prolongation of St Santin Operations
   Seconded by J H Allen; Passed nem con.

GENERAL

6. Need for Measurements over Antarctica
   Seconded by W H Campbell; Passed (30 to 3).

7. Maintenance of Observatories (Geomagnetism and Solar Flux)
   Seconded by R Hide; Passed nem con.

8. Rapidity of Exchange of Geomagnetic Data
Seconded by D W Parkinson; Passed nem con.

9. A Programme for Geophysical Observations in the African-Caribbean and Pacific Countries
Seconded by N J Skinner; Passed nem con.

The President thanked the Resolutions Committee for working hard to cast the Resolutions into (almost) fully-acceptable shape and this expression of thanks was endorsed by the Delegate's applause.

10. 6th Scientific Assembly.

The Secretary-General announced that an invitation to hold the Association's 1989 Scientific Assembly in Oslo had been received from Det Norske Videnskaps-Akademi (The Norwegian Academy of Science and Letters) and that the Executive Committee recommended acceptance of this. The invitation was received by the meeting and accepted by acclamation. The President noted that IASPEI was to be invited to hold its 1989 Assembly at the same time and at the same place, and he welcomed this further opportunity of the two Associations working in partnership.

11. Any Other Competent Business

There was none.

12. President's Resolution.

The President, from the Chair, introduced the following resolution:

IAGA thanks its hosts in Czechoslovakia for providing the milieu and hospitality for a pleasant and effective Assembly and in particular recognizes the special contributions to the success of the Assembly made by individual members of the Local Organizing Committee [Vaclav Bucha (IAGA Vice-President); Ivan Cupal; Tomas Zelinka; Vladimir Kropacek; Jan Lastovicka; Milada Moravcova; Oldrich Praus; Hana Prochazkova; Pavel Triska; Vojtech Velicky].

In speaking to it, he said he had the pleasant and welcome task of thanking our hosts in Czechoslovakia: he summed up their qualities in one four-word phrase - "accomodating, smiling, cheerful helpfulness". The resolution was seconded by the Secretary-General and the voting was drowned by an overwhelming ovation to the members of the LOC.

In reply, Vice President Bucha, on behalf of his fellow members of the LOC, said simply "Bon Voyage; visit Prague again!" Thereupon, the President closed the meeting at 1520h.

CHIEF DELEGATES

M Scherer	Belgium
D E Smylie	Canada
Bao Zongoi	China
E Friis-Christensen	Denmark
Christian Sucksdorff	Finland
Michel Blanc	France
W Mundt	Democratic Republic of Germany
H Soffel (vice K Schlegel)	Federal Republic of Germany
Haydar A Baker	Iraq
Susumu Kato	Japan
Jaime Urrutia Fucugauchi	Mexico
Jo As	The Netherlands
R Dowden	New Zealand
Asgeir Brekke	Norway
J O Cardus Almela	Spain
V V Migulin	USSR
M A Shea (vice C G A Harrison)	USA

RESOLUTIONS

SPECIAL PROJECTS [PROGRAMMES SPECIAUX]

1. Magnetic satellite [Satellite Magnétique]
   Seconded by M W McElhinny; Passed by overwhelming majority (2 opposed).

2. Solar Wind Satellite [Satellite Vent Solaire]
   Seconded by A Nishida; Passed nem con.

3. Participation in the International Lithosphere Programme [Participation au Programme International sur la Lithosphère]
   Seconded by M W McElhinny; Passed nem con.

4. Encouragement for the ILONEM Project [Encouragement au Programme ILONEM]
   Seconded by M W McElhinny; Passed nem con.

5. Prolongation of St Santin Operations [Prolongement des Opérations à Saint-Santin]
   Seconded by J H Allen; Passed nem con.

GENERAL [DIVERS]

6. Need for Measurements over Antarctica [Necessité de Mesures en Antarctique]
   Seconded by W H Campbell; Passed (30 to 3).

7. Maintenance of Observatories (Geomagnetism and Solar Flux) [Maintien de l'Activité d'Observatoires (Géomagnétisme et Flux Solaire)]
   Seconded by R Hide; Passed nem con.

8. Rapidity of Exchange of Geomagnetic Data [Rapidité de l'Echange des Données Géomagnétiques]
   Seconded by D W Parkinson; Passed nem con.

9. A Programme for Geophysical Observations in the African-Caribbean and Pacific Countries [Programme d'Observations Géophysiques dans les Pays de l'Afrique, des Caraibes et du Pacifique]
   Seconded by N J Skinner; Passed nem con.

L'AIGA, reconnaissant l'importante amélioration de notre connaissance du champ géomagnétique par suite de la disponibilité des données de MAGSAT, notant que des satellites supplémentaires de ce type sont essentiels dans des disciplines telles que la physique de l'ionosphère et de la magnétosphère, l'exploration magnétique de la croûte et les études du noyau terrestre, souscrit aux recommandations du Groupe de Travail International sur les Satellites Magnétiques, demande instamment à nouveau qu'un programme suivi de mesure vectorielle du champ géomagnétique par satellite soit entrepris dans un futur proche, et que les mesures au sol d'accompagnement nécessaires pour fournir une référence absolue et pour modéliser le champ principal soient poursuivies et, si possible, étendues.

IAGA, recognizing the great improvement of our knowledge of the geomagnetic field because of the availability of MAGSAT data, noting that additional such satellites are essential for disciplines such as magnetospheric and ionospheric physics, magnetic exploration of the crust and studies of the Earth's core, endorses the recommendations of the International Working group on Magnetic Field Satellites, and urges again that a continuing program of satellite vector measurements of the geomagnetic field be initiated in the near future, and that the associated ground measurements which are needed for absolute reference and for modelling the main field be continued and, if possible, expanded.

L'AIGA, reconnaissant que pour comprendre le couplage entre les éléments du système magnétosphère/ionosphère/thermosphère il est indispensable de connaître les paramètres du vent solaire, qui constituent le signal d'entrée de ce système, exprime son appréciation des efforts récents déployés par l'ESA et la NASA pour étendre l'utilisation du satellite IMP-8 en recevant ses données à Redoux (Belgique), et demande instamment à toutes les agences compétentes de coopérer pour fournir une couverture aussi complète que possible de la réception des données d'IMP-8, et d'examiner la possibilité de mettre en oeuvre un nouveau satellite pour mesurer les paramètres critiques du vent solaire.

IAGA, understanding that the coupling between the solar wind, the magnetosphere, the ionosphere and the thermosphere requires knowledge of solar wind parameters, since these provide the input to the system, expresses its appreciation of the recent efforts by ESA and NASA to extend the usefulness of the IMP-8 spacecraft by acquiring data from Redoux (Belgium), and strongly urges all responsible agencies to cooperate in providing as complete a coverage as possible in the continuing acquisition of IMP-8 measurements and to consider the possibility of deploying new spacecraft to measure the crucial solar wind parameters.

L'AIGA, reconnaissant les succès obtenus par les méthodes sismiques dans l'identification des structures de la lithosphère, grâce à une coopération internationale intensive s'appuyant sur des équipements de mesure et des techniques de traitement des données uniformes, et anticipant que les méthodes d'induction électromagnétique mises en oeuvre dans des conditions comparables produiront des succès similaires, recommande aux agences compétentes de soutenir financièrement les projets de recherche associés au Programme International sur la Lithosphère, tels que le Programme Européen sur la Géotraverse, d'aider à la constitution de parcs importants d'équipements magnétotelluriques répondant autant que possible à des spécifications uniformes, et d'apporter leur soutien aux programmes favorisant la normalisation des échanges de données.

IAGA, recognizing the success of seismic methods in elucidating structures in the lithosphere, arising from intensive international cooperation with uniform measuring equipment and processing techniques, and anticipating a similar success of electromagnetic induction methods under comparable conditions, recommends funding agencies to support projects associated with the International Lithosphere Programme, such as the European Geotraverse Project, to support the creation of large pools of magnetotelluric equipments preferably with uniform specifications and to support projects that work towards standardization in data exchange.

L'AIGA, reconnaissant l'importance d'une interprétation élaborée des mesures électromagnétiques pour l'amélioration de notre compréhension de la structure, de la composition, et de l'histoire tectonique de la Terre, et notant les difficultés de l'élaboration de programmes d'ordinateur fiables et efficaces pour le traitement des données, la modélisation et l'interprétation, ainsi que l'absence des moyens de calcul adéquats dans de nombreuses institutions, appuie tout effort, tel que la création du Laboratoire International de Modélisation Electromagnétique Numérique (ILONEM), visant à fournir des moyens pour développer, tester, et comparer entre eux des programmes fiables, et à offrir des services de calcul et de modélisation aux scientifiques, tout particulièrement dans les pays en voie de développement.

IAGA, recognizing the importance of advanced and reliable interpretation of electromagnetic (EM) measurements for a better understanding of the structure, composition and tectonic development of the Earth, and noting the difficulties in developing reliable and effective computer programmes for data processing, modelling and interpretation purposes and the lack of appropriate computing facilities in many institutions, endorses every effort, such as the creation of the International Laboratory of Numerical Electromagnetic Modelling (ILONEM), to provide means for developing, testing and comparing reliable programmes and to provide computing and modelling services to scientists, especially those in developing countries.

Alors que les expériences coordonnées visant à une description globale du couplage atmosphère-ionosphère-magnétosphère ont fait l'objet d'un intérêt considérable ces quelques dernières années, et que l'intérêt pour de telles expériences va croître encore dans l'avenir, l'AIGA apprend avec inquiétude qu'il est prévu de mettre fin aux mesures de diffusion incohérente par le sondeur de Saint-Santin en 1986. Les observations à Saint-Santin ont un intérêt tout particulier dans le cadre des études globales, car Saint-Santin est le seul radar opérant à moyenne latitude dans le secteur européen, alors qu'il est indispensable de diposer de mesures dans le secteur Européen aussi bien que dans les secteurs Américain et Asiatique pour pouvoir séparer les effets de variations en temps local et en temps universel. En conséquence l'AIGA recommande aux autorités françaises responsables d'examiner toutes les mesures qui permettraient de poursuivre les opérations de diffusion incohérente à Saint-Santin pour participer à des campagnes spéciales d'observations au-delà de 1986.

Whereas global experiments to study the atmosphere - ionosphere - magnetosphere coupling have received considerable emphasis during the last few years and are expected to receive more emphasis in the future, IAGA is concerned to learn about the planned discontinuation of incoherent scatter measurements at St Santin in 1986. Observations from St Santin are particularly valuable in the context of global studies because St Santin is the only midlatitude radar station in the European sector, and because measurements in the European sector and in the American and Asian sectors are required for separating local time and Universal Time effects. Accordingly, IAGA recommends that the responsible authorities in France examine every possible way to continue incoherent scatter operations of the St Santin facility for special campaigns beyond 1986.

L'AIGA, notant que l'Antarctique est une région privillégiée pour l'observation d'une large gamme de phénomènes géophysiques essentiels pour la compréhension physique de l'atmosphère et du milieu spatial proche de la terre, et reconnaissant qu'elle se prête particulièrement bien à la coopération scientifique internationale, recommande que les agences responsables maintiennent leur soutien financier aux expériences existantes en Antarctique, et installent de nouveaux équipements pour l'étude de l'ionosphère, la thermosphère, la mésosphère, la stratosphère et la terre solide dans cette région, à l'aide d'instruments au sol, à bord de fusées, et de satellites en orbite basse.

IAGA, noting the importance of Antarctica as a unique area in which to observe a great variety of geophysical phenomena, which are essential for the understanding of the physics of atmospheric and near-Earth space processes, and recognizing its particular suitability for international scientific cooperation, recommends that funding agencies continue to support existing experiments in Antarctica and implement new installations of equipment for studying the ionosphere, thermosphere, mesosphere, stratosphere and solid Earth in these regions by means of ground-based instruments, rockets and low altitude orbiting spacecraft.

L'AIGA, reconnaissant la contribution essentielle apportée à de nombreux programmes de recherche par les longues séries temporelles de données de surveillance de l'activité solaire et géomagnétique que constituent les enregistrements des observations magnétiques et les observations du flux radioélectrique solaire à 10,7 cm, recommande fortement aux agences responsables de s'efforcer de sauvegarder l'avenir de ces programmes d'observations continues ainsi que les activités d'archivage et de diffusion de leurs résultats.

IAGA, recognizing the essential role in support of numerous research programmes of the long time-series of monitoring data describing solar and geomagnetic conditions provided by magnetic observatory records and the 10.7 cm solar radio flux observations, strongly recommends to funding agencies that efforts be made to safeguard the future of these monitoring programmes and the archiving and dissemination of their results.

L'AIGA, reconnaissant qu'il est important de poursuivre la publication des indices géomagnétiques définitifs et des données résumées sur l'activité géomagnétique rapide en respectant un délai maximal approprié, réaffirmant sa politique de poursuite de la publication des bulletins de la série n° 32 de l'AIGA, et notant que les retards causés par un petit nombre d'observatoires portent un préjudice notable à l'utilité du réseau tout entier, demande instamment aux observatoires magnétiques d'envoyer très rapidement leurs rapports sur l'activité, leurs indices, et leurs listes de contrôle à tous les services permanents jouant un rôle dans la publication de ces bulletins.

IAGA, recognizing the importance of continued publication of definitive geomagnetic indices and of summary data on rapid geomagnetic activity in a timely manner, reasserting its policy of continued publication of the IAGA Bulletin No 32 series, and noting that delays caused by a small number of observatories have a serious adverse effect on the usefulness of the whole network, urges the magnetic observatories to report activity and indices, and to return check lists, promptly to all permanent service centres which are involved in this process of publication.

L'AIGA, notant que 65 parmi les états du groupe AFRIQUE-CARAIBES-PACIFIQUE ont signé avec la Communauté Européenne une convention, connue sous le nom de Convention de LOME III, aux termes de laquelle des fonds seront mis à la disposition de ces pays pour la réalisation d'expériences scientifiques et le développement de la recherche, demande instamment que cette possibilité soit mise à profit pour promouvoir dans ces pays les sciences relevant de l'AIGA, et amener ainsi, entre autres bénéfices, un progrès significatif dans la direction d'une couverture véritablement globale des phénomènes géomagnétiques et aéronomiques, et recommande à la Communauté Européenne d'apporter son soutien à ces programmes dans le cadre de la Convention de LOME.

IAGA, noting that 65 countries belonging to the group of AFRICAN - CARIBBEAN - PACIFIC states have signed with the European Community a convention, known as the LOME III Convention, by which funds might be available to those countries in order to implement scientific experiments and to develop research, urges that this possibility be used for promoting IAGA-related science in these countries, thus leading among other benefits to a significant step towards a fully global coverage of geomagnetic and aeronomic phenomena, and recommends such programmes to the European Community for funding under the Lome Convention.

EXECUTIVE COMMITTEE

MINUTES

Technical University, Prague: August 1985

Thursday, 8th	12.30-14.00	Thursday, 15th	19.30-21.40
Monday, 12th	08.00-10.10	Friday, 16th	15.40-17.45
	17.30-22.00	Saturday, 17th	09.00-16.00

Present: President D I Gough
Vice Presidents V Bucha, R E Gendrin
Secretary-General M Gadsden
Members: K D Cole, N Fukushima, O Raspopov, R G Rastogi, U Schmucker, D J Williams (departed noon, Monday 12th)

I. MINUTES OF THE MEETING IN FLORENCE, 5-7 SEPTEMBER 1984

The draft of these minutes was printed in IAGA News No:23, pp 43-49.
Moved by Cole, seconded by Williams, passed as true and correct record.

II. MATTER ARISING FROM THE MINUTES NOT COVERED BY LATER ITEMS IN THE AGENDA.

Fukushima reported that the Transactions of the General Assembly (Hamburg, 1983) were now completed and that the camera-ready copy had been sent to Aberdeen for printing.

III. REPORT FROM THE SECRETARY-GENERAL.

a. Administration of the Assembly

On the initiative of President Gough, a Resolutions Committee was proposed, to consist of Gendrin (chairman), J H Allen, E Kazmirovsky and C Sucksdorff. Approved. [All three members were agreeable to serving and the final Conference of Delegates expressed appreciation of the hard and effective work done by this Committee; see p.8.]

Colleagues from IAMAP were invited to join the Executive Committee for the first part of the meeting on Monday evening. The Chief Delegate from Norway, A Brekke, and his colleague E Thrane were invited to come to the Executive Committee meeting on Thursday evening.

The Executive Committee took note of correspondence from the President of the Federation of Astronomical and Geophysical Services (P Melchior) concerning the International Service of Geomagnetic Indices and directed the Secretary-General to call a meeting of concerned parties to advise the Executive Committee when it came to consider this matter. [Agenda item IV(b) below: pp.24.]

President Gough invited Division Chairmen and Interdivisional Commission [IDC] Leaders to meet with the Executive Committee immediately after the second Conference of Delegates on Friday, 16th August. Present at this meeting were McElhinny (Internal Magnetic Fields), Nishida (Magnetospheric Phenomena), Taubenheim (Middle Atmosphere) and Zaitzev (Antarctic Research) with Executive Committee Member Rastogi to speak for the IDC on Developing Countries. The purpose of this meeting was to discuss administrative problems and to assess the effectiveness of the Assembly.

McElhinny reported that the Division I meetings were well attended, there being typically "full houses" (>77) on many occasions with 100 or so on the first day. There were many people present who were discovering IAGA for the first time and more information was needed both to be diplayed at the Assembly and to be printed in the Abstracts Book on the meaning of the organizational numbers and the titles of working groups. It should be made clear in the Assembly material that working groups are for all delegates, not for a coterie. President Gough reasserted the IAGA philosophy that anyone may attend any meeting. [Note added by the Secretary-General: It is written in ByLaw 10 that the Conferences of Delegates (and by natural extension, any of the IAGA sessions) are open to members of the public.]

Nishida reported that Divisions III and IV had jointly discussed their present structures and decided that, for the present, they were adequate to their needs but the Leaders would in future take a very close look at the overlapping of interests and the joint scheduling of symposia.

Taubenheim reported that the MAP IDC was healthy and that 70 papers had been presented at its sessions. He, and the IDC membership, were encouraged to know that their interests would be well looked after in Division II particularly through the establishment in that Division of a working group on MAP.

Zaitzev reported that the business meeting of the Antarctic IDC had been well attended (>30) and that the future of the Antarctic interests in IAGA could be adequately assured in a Joint Working Group lying between Divisions III and IV. He mentioned three projects of special interest,

Carbon Data Analysis Workshop
Joint balloon launches, 1987 to 1989
VLF experiments on stimulated and
naturally-occurring phenomena

Rastogi reported that there was a poor attendance at the Developing Countries IDC meeting in consequence of the clash with Division meetings. He noted the upcoming International Electrojet Year (1987-1988) and reported that the Data Processing Workshop [Agenda item VII(c): p.28] had attracted good UNESCO support. However, few of the participants at this workshop had come to the IAGA Assembly. There will be another workshop in January 1987. Cole mentioned the SCOSTEP Global Ionospheric Study scheduled for 1988-1989 which would involve studies of the equatorial electrojet and therefore could be of significance to IAGA science in developing countries.

b. Financial report for the year 1984

The financial report for the calendar year 1984 had been laid before the Executive Committee and it is printed on page 34.

c. Current accounts

The ledger account for the period 1985 Jan 1 to Jul 26 [see p.33] was laid before the Executive Committee. The Secretary-General drew attention to the fluctuations in exchange rate shown by these accounts when compared with the 1984 accounts. The Executive Committee took note of the excess of income over expenditure in both the 1984 accounts and the ledger accounts. The Secretary-General explained that the 1985 excess would be decreased by the printing and distribution of the Hamburg Assembly Transactions and of IAGA News No.24, all of which will come to charge in the calendar year 1985.

The Executive Committee noted that the Executive Board of ICSU had awarded $2000 towards the cost of the International Workshop on Data Processing in Geomagnetism and that this was one of five such awards, totalling $14000, made in 1985.

IV. REPORTS ON IAGA-RELATED ACTIVITIES.

a. Electromagnetic Lithosphere-Asthenosphere Sounding (ELAS)

President Gough reported on the Inter-Association Working Group [IAWG] on ELAS. He continues as convenor of the IAWG because a vice-chairman has yet to be identified. The situation will be resolved shortly. A midterm report on ELAS has been prepared for Co-ordinating Committee No.5 [CC5] of the Interunion Commission on the Lithosphere [ICL]. This report will be published as part of the midterm report of CC5 to the ICL.

President Gough reported briefly on the EMSLAB project, the largest electromagnetic sounding experiment yet undertaken on the Earth. Eighty-five stations of a magnetovariation array and five telluric stations are recording over the Juan de Fuca plate and the states of Washington and Oregon. Preliminary results should be available for the General Assembly in 1987.

b. International Service of Geomagnetic Indices (ISGI)

The President (P Melchior) of the Federation of Astronomical and Geophysical Services (FAGS) in his role also as Secretary-General of the IUGG had brought to the attention of the IAGA Secretary-General some expressions of concern about the flow of publications in the IAGA Bulletin 32 series. As a way of considering the problem in an expeditious manner, the Executive Committee had directed the Secretary-General to call a meeting to provide expert advice to the Executive Committee.

The Secretary-General reported that he had chaired an informal meeting (present: Cardus, Cole, Fukushima, Gendrin, Menvielle, Rastogi, Siebert and Stuart). The following points were made:

(i) The service is of such fundamental importance in the IAGA fields of research that discontinuation of the ISGI is not an option.
(ii) There are four national groups or laboratories that are interested in taking on the ISGI commitment and which have sufficient resources to cope with the continuing obligation. Each of the four was judged capable of running the service satisfactorily.
(iii) The meeting agreed that the Royal Netherlands Meteorological Service (KNMI) had for many years provided an excellent service to the geophysical community through the operation of the ISGI and regret was expressed that the time was now approaching when the involvement of the KNMI was perforce coming to an end.

The Secretary-General reported to the Executive Committee that he had, subsequent to this informal meeting, telexed to the KNMI asking for clarification of the current position concerning support and the reply had come that support must cease no later than the end of 1986.

The Executive Committee decided to send a statement of position to the President of FAGS and to request the four institutions to make their firm proposals to him direct. The decision as to the future of ISGI is therefore at present in the hands of the President of FAGS.

c. Relations with IAMAP

Two International Commissions from IAMAP [Meteorology of the Upper Atmosphere (ICMUA) and Radiation (ICR)] were holding their meetings coincident with the Assembly, as part of the Assembly, and their leaders had been involved in development of the Assembly programme right from the start.

President Gough welcomed some of our friends from IAMAP (Bojkov, Ebel, Gille, Godson, Hirota, Roper) to the Executive Committee meeting on Monday evening, 12th August. An earlier informal discussion between President Gough, Roper and Ebel of the Executive Committee agenda indicated that the only matter on it

of special interest jointly to the Associations was to discuss the symposium topics that had been settled at the IUGG Executive Committee meeting in Hawaii the previous week. Of these,

11. "Middle Atmosphere and its latitude dependence" (IAGA, with IAMAP): 3 half-days

was the one of immediate interest. After discussion, it was decided to recommend to the Secretary-General of IUGG a change in name:

11. "Highlights of Middle Atmosphere research" (Convenors: Paul C Simon, IAGA, and I Hirota, IAMAP): 3 half-days

Godson spoke for IAMAP in welcoming the continuing cooperation between IAMAP and IAGA, exemplified particularly in the common interest in the middle atmosphere. Cole pointed out that this overlap of interest specially involves Division II.

Roper introduced recommendations for a joint IAGA/IAMAP programme at the 1987 Assembly. These have come from general discussions between people interested in and involved with middle atmosphere research; under the general direction of Roper and Taubenheim, there should be

"Middle Atmosphere Aeronomy" (Convenors: Megie, G Thomas): 5 half-days
"Middle Atmosphere Dynamics" (Convenors: Manson, O'Neill): 3 half-days
"Differences between Arctic and Antarctic Middle Atmosphere" (Convenors: Rycroft, Labitzke) 2 half-days

There would thus be, as Roper pointed out, a total of 13 half-days devoted explicitly to the Middle Atmosphere.

V. IAGA INTERNAL STRUCTURE.

a. Divisions III and IV

The Executive Committee considered a number of letters concerning problems of congestion in the Division III programme and of scheduling sessions in the Division III and Division IV programmes taking place at the same time and covering similar areas of interest.

The Executive Committee decided that in future more thought must be given to the practicability of running Division III sessions in parallel to ease congestion. As a general rule, papers dealing with any or all bow shocks should be presented in Division IV sessions; those concerning the magnetosphere from the magnetopause in belong with Division III. When needed, a joint session of Divisions III and IV should take care of papers dealing with the magnetosheath. The time scheduled for any joint session of the two Divisions must be left clear of other

(competing) sessions. It is clear that the Programme Committee should make a rigorous and careful scrutiny of overlapping sessions for involvement of identical research interests.

b. InterDivisional Commissions (IDCs)

The Secretary-General had circulated a letter (dated 18th February, 1985) to IAGA Leaders in which he invited their comments on the future and modi operarum of the IDCs. To quote from the letter

> It is clear that, as time passes, new programmes are executed, new requirements arise and new connections between branches of the IAGA discipline appear. It follows that if the Divisions of IAGA are to be the principal foci of our research, some check on the life of IDCs is needed, to avoid swamping the Divisions numerically.

A wide-ranging discussion took place from which a consensus emerged: the History IDC and the Developing Countries IDC have relations with all the Divisions but the others have scientific relevance which belongs either in one Division or principally between two Divisions. The Joint Working Group (JWG) on the Auroral Oval and its Extension into Space was cited as a model of interdivisional cooperation. The research papers emerging from an IDC or a JWG should be presented in the sessions of a relevant Division. This would help to integrate the scientific endeavours into the wide context of a Division's area of interest. The special concerns, often of a planning or a logistic nature, are more properly left to a smaller working group which meets in the evening.

In the case of the IDC on Middle Atmosphere Program (MAP), the Executive Committee recognized that this IDC has worked well and efficiently; the many well-attended sessions at the Assembly attest to this. The Executive Committee however felt it was now time to absorb the MAP interests into Division II, with the new Division leadership that takes over at the end of the 1987 Assembly properly reflecting the enhanced presence of the MAP interests in Division II.

By unanimous votes in each case, the Executive Committee resolved to recommend to National Bodies the following changes in ByLaw 1:

> The IDC on External/Internal Geomagnetic Relations to become the JWG on External/Internal Geomagnetic Relations.
>
> The IDC on Antarctic Research to become the JWG on Antarctic Research.
>
> The IDC on Middle Atmosphere Program to be discontinued.

[The procedure is for three separate resolutions to be brought before the first Conference of Delegates at the General Assembly

in 1987 for voting. The resolutions that are passed take effect at the close of that Assembly.]

VI. IAGA SUPPORT FOR PARTICULAR PROJECTS.

At the request of Gendrin, the Executive Committee had a short discussion on the deontology of response to proposals for support, backing or sponsorship. The majority has agreed to have a broad involvement in responding to individual proposals or requests which are made between Executive Committee meetings and which call for a quick response.

VII. SPONSORSHIP OF MEETINGS.

a. Summary of actions in the past eleven months

The Secretary-General reported that IAGA sponsorship had been cofirmed since the last Executive Committee meeting to

International Symposium on the Polar Geomagnetic Phenomena
Souzdal (USSR) May 25-31, 1986.
Secretary: A N Zaitzev

First Globmet Symposium
Dushanbe (USSR) Aug 19-24, 1985.
Convenor: V A Nechitailenko

International MAP Symposium
Kyoto (Japan) Nov 26-30, 1984.
Chairman: Susumo Kato

Working Workshop on Geomagnetic Observatories
Ottawa (Canada) Jul 30 - Aug 9, 1986
Registration: R L Coles

8th Workshop on Electromagnetic Induction
Neuchatel (Switzerland) Aug 24-30, 1986.
Chairman: B A Hobbs

b. Future meetings

The Executive Committee received a request for sponsorship of the following parts of the 26th COSPAR meeting at Toulouse (France), Jun 30-Jul 12, 1986:

Symposium 1 on Active Experiments
6 Solar Wind Interactions
9 Physics of the Thermal Plasma in the Magnetosphere
12 Comets Halley and Giacobini-Zinner
Workshop IX Proposed Reference Models of Trace Constituents of the Middle Atmosphere and Data

XI International Reference Atmosphere
XV Presentation of CIRA 1986 and Comparisons with Other Models, Data and Theories

Sponsorship of these was granted, together with a token sum in partial support.

A request had been received from Oni (Nigeria) for the Executive Committee to take note of proposals to hold the First International Workshop on the Stability of the Western Sector of the African Plate; a general outline of the plan was laid before the Executive Committee. A decision on sponsorship was deferred until the documents and supporting case had been put before the Leaders of the appropriate Divisions for their recommendation. The Executive Committee noted that the proposal had been placed before the IUGG Executive Committee meeting in Hawaii the previous week. President Gough reported that the IUGG Executive Committee felt unable to sponsor this meeting as at present conceived.

A request was received from Mundt (German Democratic Republic) for sponsorship of a symposium

"Space-Time Structure of the Geomagnetic Field"
Lutherstadt-Wittenberg (GDR) Sept 22-27, 1986

President Gough was asked to offer sponsorship in category 3 [see IAGA News No.22, p.116].

Williams introduced a letter from Meng (USA) in which the first steps towards a special Sydney Chapman Centenary (1988) meeting on Auroral Physics were described. The Executive Committee welcomed these plans and would be receptive to a formal request for IAGA sponsorship.

c. Report on International Data Workshop (Pune)

Rastogi presented a detailed report on this workshop [see p.35] and this led to an extensive discussion. The Executive Committee was informed that the Workshop had been well supported, well received, and that congratulations to the organizers were in order. It had been hoped that concrete proposals of venue, topic, dates etc for a second workshop could have been made at the Assembly but this had not proved feasible. It was agreed that the momentum for a second workshop must be kept up and input from the Division leadership is to be sought.

VIII. Cooperation and activities with other bodies

a. International Astronomical Union (IAU)

The next General Assembly of the IAU will be held in New Delhi from 19 to 28 November, 1985. The IAGA representative at this Assembly is R G Rastogi.

b. International Geosphere-Biosphere Programme (IGBP)

The draft outline of a possible IGBP to study global change has been produced by the Ad hoc Planning Group on Global Change and been given wide circulation by President Kendrew of ICSU. The Secretary-General had received copies of comments on the draft plan made by Roederer in letters dated Nov 13, 1984, and Jul 9, 1985.

President Gough pointed out that the draft outline circulated from ICSU contained no discussion of solid Earth or STP topics. Williams agreed that this was an undesirable fault in the plan; agreeing with much of Roederer's criticism of the plan, Williams urged that IAGA can and should take a major and active role. Cole drew attention to a key sentence in the ICSU draft outline which reads

> ".....with biospheric interactions as the focus and discriminator in setting priorities and in establishing principal emphases."

In Cole's view, this showed how the plan for the IGBP does not adequately incorporate STP elements. Since "Man is now part of Space", STP aspects must be an essential part of any IGBP. IAGA should make its voice heard clearly, now, without delay. Williams agreed most emphatically.

The Executive Committee decided, first, to ask President Gough to write to Kendrew straightaway to express these emphatic views. Secondly, Bucha was asked to chair a working party of the five Division Leaders to prepare a list of projects involving IAGA participation at two levels:

(i) To see what can be done in the framework of the ICSU draft plan and

(ii) To study how much more effective IAGA participation could be in a widened framework.

The working party was to report back to the Executive Committee as soon as possible as the matter is urgent.

c. ICSU

The Secretary-General reported that there had been some correspondence passing between one of the IAGA National Correspondents, himself, and Tandberg, Secretary of the ICSU Standing Committee on the Free Circulation of Scientists. This concerned principally the issue of visas to bona fide scientists wishing to travel to Prague to attend the Assembly. The Executive Committee directed the Secretary-General to keep the host National Bodies of future Assemblies informed of the need to adhere to "Advice to Organizers of International Scientific Meetings", which is issued by the ICSU Standing Committee.

Gendrin mentioned that there could be problems of this nature in connection with the projected meeting of the ICSU Scientific Committee on Antarctic Research [SCAR] to be held in South Africa. He pointed out that it would be normal practice for representatives from IAGA to be invited.

IX. THE XIXth GENERAL ASSEMBLY OF IUGG.

A joint report to the Executive Committee, signed by McElhinny (Division I), Rees (Division II) and Nishida (Division III), stated that they had received a proposal from Gokhberg for a symposium on "Earth-Ionosphere-Magnetosphere Coupling by Acoustic and Electromagnetic Action". In their opinion, research in this field is currently being pursued by a few groups only and the total number of scientists involved is small in comparison with other subjects and disciplines in the three Divisions. They recommend that the results of recent research can be accommodated within the sessions already proposed for the 1987 Assembly. Gendrin recalled that symposia on this very topic have been held at the European Geophysical Society meeting (Louvain, 1984), or will be held at the forthcoming Electromagnetic Compatibility Conference (Warsaw, 1986). He thinks that it would not be wise that IAGA does not seriously consider these natural phenomena which may have important implications with respect to the study of earthquakes. He suggested that Gokhberg submit a report on the results so far obtained and that the scientific topics which should be addressed in order to progress in this field of research. Such a report could be reviewed for the benefit of the Executive Committee by three experts, viz, Dr Jdanov (for the solid Earth aspects), Dr Richmond (for the atmospheric effects) and Dr Southwood (for the electromagnetic wave propagation effects). All of them have agreed to do this. Gendrin ended by saying that this type of research could be an important area in IGBP. The Executive Committee concurred with these views and left open the possibility of a separately-scheduled symposium at an Assembly in the future, when the research field could be more mature.

President Gough reported on a number of details concerning the administration of the forthcoming General Assembly. The Secretary-General reported that he was already in close touch with McEwen (Canada) who is the designated liaison correspondent for IAGA on the Canadian National Committee for the IUGG.

President Gough also presented a list of Union symposia for the General Assembly. These had been accepted at the IUGG Executive Committee meeting in Hawaii which President Gough had attended the previous week. IAGA is formally involved at some level in 11 of the 20 symposia. These 11 are listed below:
["[n]" = n half-days. Associations are abbreviated with the code: A:ICL B:IAG C:IAGA D:IAHS E:IAMAP F:IAPSO G:IASPEI H:IAVCEI]

1.	Quo Vadimus? [2]	Union
2.	Instability within the Earth and Core Dynamics [3]	Union
4.	Variations in Earth Rotation [3]	BECGF
7.	Lower Crust Properties and Processes [3]	GHCA
9.	Evolution of Mid-Oceanic Ridges [3]	HGCA
10.	Comparative Planetology [4]	HCEBG
11.	Middle Atmosphere and its Latitude Dependence [3]	CE

[continued]

12. Displaced Terranes and Continental Accretion [3] CGHA
13. Results of the EMSLAB project [2] CGHA
15. Contribution of Geophysical Sciences to Climate Change Studies [4] E+all others
20. Geochemistry and Geophysics of Transport in the Lithosphere-Asthenosphere System [3] AGHC

X. ANY OTHER COMPETENT BUSINESS.

a. Contributed papers

In order to distinguish between the acceptance of a paper, allowing the author to apply for a travel grant, and the exact specification of how, when and where the paper is to be presented, there should always be two letters of acceptance for contributed papers. One letter states that the paper has been accepted for presentation at the Assembly (and this could be sent out quite early in the process of programme compilation) and the second letter gives the author the programme details. Convenors should bear in mind that papers can be rejected and can be merged. The quality of contributed papers should be assessed with a critical eye; the convenor of a session is best placed to do this and therefore has this responsibility.

The Executive Committee agreed that assignment of 15 minutes (including discussion) to each paper is just acceptable but that 12 minutes is too short. Convenors, therefore, are asked not to schedule more than 4 papers per hour in future.

Schmucker noted that a poster session should have an introductory (oral) presentation by a "Rapporteur" who surveys what is to be seen in the poster session. To allow the rapporteur to do this, authors of posters papers should provide an outline (perhaps 1 slide and an extended summary) to the rapporteur in advance of the Assembly.

b. IAGA Mailing List

Two requests for commercial use of the IAGA Mailing List had been received. After discussion, the Executive Committee refused such use; the refusal is not related to either or both of these requests in particular but is a general one. The Secretary-General pointed out that IAGA publications, including address lists, are protected by copyright and he would recomend action be taken against any persons outwith the IAGA community who infringed this.

c. 1989 Scientific Assembly

President Gough reported that he had received an invitation from Det Norske Videnskaps-Akademi (the Norwegian Academy of Science and Letters) to hold the next Scientific Assembly in Oslo in 1989. The invitation was also presented to the Executive Committee by the Chief Delegate for Norway (A Brekke) and it was

welcomed with acclamation. The Executive Committee recommended acceptance of this invitation to the Conference of Delegates [see p.9].

Brekke also asked that in view of the special interests of Norwegian scientists the Assembly should include symposia dealing with

The Proton Aurora
EISCAT-related topics
MAC-related topics

The Executive Committee felt that these wishes could be accomodated without any problem.

d. Mathematical and Numerical Geophysics

Cain proposed to the Executive Committee in a letter that a new IDC be formed to provide a sharper focus on both analytic and numerical techinques applied to the several disciplines of IAGA.

Fukushima pointed out that there is already an IUGG Committee for this and the structure of this Committee is reviewed every four years at the General Assembly. It was felt, however, that the Union Committee showed little or no concern with the research fields covered by IAGA. Gendrin suggested that the topic should begin to be dealt with as a working group within Division V. Schmucker pointed out that an InterDivisional Workinbg Group would be a more appropriate approach.

The Executive Committee decided to ask a Division to provide a half-day synposium at the 1989 Assembly and thereby to test the need for an IDWG, which could be formally incorporated into the IAGA structure if need be at the 1993 Assembly.

e. International Working Group on Magnetic Field Satellites

Schmucker intimated that the members of this working group would like to explore the possibility of becoming an identifiable element inside IAGA. The Executive Committee asked that discussion be started with the Leaders of Divisions V and I and to be kept informed of progress.

e. Next meeting of the Executive Committee

Five out of the ten members of the Executive Committee plan to be in Toulouse (France) in 1986 for the SCOSTEP and COSPAR meetings. It was decided, therefore, to take advantage of this and to schedule a "meeting of opportunity" for July 4-6, 1986, in Toulouse.

APPENDIX TO MINUTES:

Ledger Account, 1985 Jan 1 to Jul 26

Amounts in US Dollars [$1.40 = £1.00]

Receipts:	IUGG Annual Grant	29521.95	
	IUGG, Prague Assembly	3301.87	
	Sales of Publications	913.63	
	Bank interest	2261.11	35998.56
Expenditure:	Personnel	135.52	
	Supplies and Equipment	134.67	
	Communications	999.07	
	Admin. Travel	0.00	
	Miscellaneous	29.60	1298.86
	Publications	3600.70	
	Assemblies	11652.90	
	Meetings, Symposia	-1377.05	
	Grants	3381.11	17257.66
	Excess of income over expenditure		17442.04

INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY
Financial Report for the year 1984
Amounts in US Dollars Exchange rate $1.15 = £1.00

RECEIPTS	IUGG	GRANTS CONTRACTS
15 IUGG ALLOCATION	19940.11	x
2 UNESCO GRANTS	x	x
3 OTHER GRANTS	x	2845.54
4 CONTRACTS WITH UNESCO, etc	x	x
5 SALES OF PUBLICATIONS	x	x
6 MISCELLANEOUS	1388.80	x
7 TOTAL RECEIPTS	21328.91	2845.54
8 CASH ON HAND AND IN BANKS Jan 1, 1984	7833.65	x
9 INVESTMENTS RESERVES Jan 1, 1984	9200.00	x
10 TOTAL	38362.56	2845.54

EXPENDITURES	IUGG	GRANTS CONTRACT
11 ADMINISTRATION	810.88	x
12 PUBLICATIONS	5266.54	x
13 ASSEMBLIES	x	x
14 SYMPOSIA SCIENTIFIC MEETINGS	7168.89	x
16 GRANTS (Permanent Services etc)	x	x
17 CONTRACTS WITH UNESCO, etc.	x	x
18 MISCELLANEOUS	0.29	x
19 TOTAL EXPENDITURE	13246.60	x
20 CASH ON HAND AND IN BANKS Dec 31, 1984	5788.61	x
21 INVESTMENTS RESERVES Dec 31, 1984	19327.35	2845.5
22 TOTAL	38362.56	2845.5

	January 1, 1984	December 31, 1984
23 ACCOUNTS RECEIVABLE	0.00	0.00
24 ACCOUNTS PAYABLE	0.00	0.00

Pre-convention Workshop: August 4

Reconcilation of magnetic measurements on natural and synthetic samples

Convenors: Vladimir Kropacek,
Nikolai Petersen, Peter Shive

The workshop took place over one full day on Sunday, August 4th, 1985. The convenors accepted 29 contributions which varied in nature from "normal" papers to brief contributions in the form of extended comments. Unfortunately seven papers were not presented due to the absence of the authors. [The titles of the contributed papers are given at the end of this report.] The contributions fell naturally under three headings:

(1) Depositional remanent magnetization (DRM) and small particles
(2) Titanomagnetites and their oxidation products
(3) General

The workshop provided a forum for the presentation of new ideas on how to bridge the gap between results from measurements on natural samples on the one hand and on synthetic "equivalents" on the other.

The first group of papers discussed the evidence from laboratory experiments and paleomagnetic studies for systematic errors in the remanent magnetization of sediments. The papers illustrated a current controversy for some paleomagnetic results from natural sediments indicated that such errors are not normally present, while other magnetic results from laboratory experiments indicated that such systematic errors could occur. The first group of papers also documented further the detailed hysteresis properties of fine-grained magnetite/hematite assemblages under variation of grain size and relative composition. Finally, for the first time the presence and predominance of bacterially-produced single-domain magnetite was documented within deep sea sediments.

The second part opened with an attempt to classify titanomagnetites of different composition and oxidation state by means of hysteresis loop and susceptibility measurements. Three contributions then dealt with different techniques of preparing synthetic titanomagnetites and the resulting consequence of varying magnetic properties. The remaining contribution to this part of the workshop treated various aspects of low-temperature oxidation of titanomagnetites. In this contribution the surprising result was that initial non-

stoichiometry of titanomagnetite does not affect the process of subsequent low-temperature oxidation.

The third and rather more inhomogeneous group of papers dealt with phenomena related to the magnetic domain state and with various experimental aspects of rock magnetism.

The well attended workshop clearly demonstrated the rising interest in the various aspects of "fundamental" rock-magnetism.

Titles of the contributed papers:

Compaction shallowing of a synthetic PDRM - Kodema and Anson.

Paleomagnetic evidence from natural sediments for the lack of a systematic inclination error - Lund and Henyey.

Remanence of laboratory-redeposited lake sediments - Levi and Banerjee.

Comparison of hysteresis loops of synthetic samples with varying contents magnetite and hematite - Mauritsch, Becke, Kropacek, Hejda, Zelinka.

Bacterial magnetite as carrier of natural remanent magnetization in deep sea sediments - v Dobeneck, Petersen and Vali.

Reconciliation of low-temperature hysteresis and susceptibility measurements from basalts with those from synthetic titanomagnetites - McElhinny.

Preparation and characterization of titanomagnetites precipitates in silicates - Worm and Markert.

The production of titanomagnetite single crystals by flux growth - Smith.

The effects of the initial non-stoichiometry of titanomagnetite (TM 60) on the Curie temperatures of titanomaghemites - Moskowitkz.

Diversity of titanomaghemites: effect of cation distribution? - Kono, Tanaka and Nishitani.

Synthetic analogs of submarine titanomaghemites - Banerjee, Worm and Suk.

Effects of low temperature oxidation on the direction of remanence in fine grained oceanic basalts - Beske and Diehl.

Chemical remanent magnetization after the oxidation of magnetite - Heider and Dunlop.

Formation of shrink cracks in low-temperature oxidized titanomagnetites - Petersen and Vali.

Discrepancies between experimental observations in natural and synthetic samples - Vincenz.

A contribution to magnetic properties of natural cobaltite - Krs and Kropacek.

Domain pattern vs. measured behaviour in MD titanomagnetites - Halgedahl.

Grain-size dependence of domain state and magnetic properties - Fuller.

Method of determination of Curie point in rocks and synthetic samples - Prevot.

Modelling of hysteresis data using SIMPLEX - Thompson.

An intensive pulse-magnetization system for IRM acquisition experiments - Kirshvink

The magnetic properties of a Tertiary iron crust in SE Belgium and synthetic Mn-substituted goethites - Stiers and Hus.

DIVISION I

Chairman:	M W McElhinny	(AUSTRALIA)
Vice-Chairman:	M Kono	(JAPAN)
	R A Langel	(USA)
	M S Zhdanov	(USSR)

The Division covers a very wide range of scientific studies of the geomagnetism of the solid earth through six Working Groups.

WGI-1: Analysis of the Main Field and Secular Variations

Chairman:	D R Barraclough	(UK)	1983-87
Vice-Chairman:	W Mundt	(GDR)	

The main task of this group is the description of the main field in a periodically updated International Geomagnetic Reference Field (IGRF) and Definitive Geomagnetic Reference Field (DGRF) for past epochs. The models consist of sets of spherical harmonic coefficients and have become widely used as a means of deriving values of geomagnetic components for use in, for example, studies of magnetic anomalies and investigations of charged particle motions in the ionosphere and the magnetosphere.

Since the adoption of the first IGRF (IGRF 1965) by IAGA in 1968, the IGRF has been revised twice to give IGRF 1975 (in 1976) and the third generation IGRF (in 1981). The Working Group 1 recommended the following additions and modifications to the third generation IGRF to produce the fourth generation IGRF (1985):

1. the extension of the DGRF to 1980.0 by the adoption of a new model (DGRF 1980) to replace IGRF 1980.

2. the addition of an IGRF for the interval 1985.0 to 1990.0 (IGRF 1985) consisting of a model of the field at 1985.0 and a predictive model of the secular variation for use in adjusting the main field model to dates between 1985.0 and 1990.0.

3. the adoption of a Provisional International Geomagnetic Reference Field for the interval 1980.0 to 1985.0 (PGRF 1980) defined by linear interpolation between the coefficients of DGRF 1980 and IGRF 1985 (main field).

4. the addition of a series of main field models for epochs 1945.0, 1950.0, 1955.0, 1960.0 (IGRF 1945, IGRF 1950, IGRF 1955 and IGRF 1960).

The DGRF now spans the interval 1965.0 to 1980.0 by means of four main-field models for 1965.0, 1970.0, 1975.0 and 1980.0 (DGRF 1965, DGRF 1970, DGRF 1975, DGRF 1980).

For dates between the epochs of the models linear interpolation between the coefficients of the two models on either side of the date is to be used. A similar procedure is to be used for dates in the interval 1945.0 to 1965.0 using IGRF 1945, IGRF 1950, IGRF 1955, IGRF 1960 and DGRF 1965 models as appropriate. Extrapolation back to 1940.0 will probably be reasonably accurate, though this was not formally recommended by the Working Group.

Further revision of the DGRF is not anticipated.The pre-1965 models (IGRF 1945 to IGRF 1960) will probably be replaced by definitive models in 1987. The newly adopted DGRF 1980 models replaced the former PGRF 1975 and IGRF 1980. The present PGRF 1980 will be superseded when a definitive model of the main field at 1985.0, different from IGRF 1985, is adopted.

WGI-2: Theory of Planetary Magnetic Fields and Geomagnetic Secular Variation

Chairman:	I A Eltayeb	(SUDAN)	1981-85
	D E Loper	(USA)	1985-89
Vice-Chairman:	D E Loper	(USA)	1981-85
	F H Busse	(FRG)	1985-89

This group continues to attack the difficult problems of mathematical analysis of the geomagnetic dynamo. Of particular interest has been whether conditions at the Core-Mantle Boundary (CMB) can be defined starting with the two observables (i) the magnetic field at the Earth's surface, and (ii) the decade fluctuations in the length of the day. Extrapolation of the magnetic field to the CMB is hampered by difficulties in the separation of the field into internal and external parts and in identifying a reliable method of inversion. Different methods of inversion produce results that do not agree.

Decade fluctuations are believed to be due to the transfer of angular momentum between the outer core and mantle. The coupling is due to tangential stresses that can be produced by bumps on the CMB, although electromagnetic coupling may be relevant if the electrical conductivity of the mantle changes rapidly with distance from the centre of the earth.

There is general agreement that the two observables do not produce definite conditions at the CBM because the whole problem suffers from non-uniqueness. At the main symposium on this topic at Prague, different theoreticl models and fields at the CMB were presented, all of which were capable of producing the observations at the surface. Of particular interest recently has been work on the formation of a stable

stratified layer in the upper part of the outer core by the process of gravitational buoyancy. It is now accepted that gravitational buoyancy is a strong candidate for powering a geodynamo with a strong toroidal magnetic field.

WGI-3: Electromagnetic Induction and Electrical Conductivity (Earth and Moon)

Chairman: B A Hobb (UK) 1983-87
Vice-Chairman: S E Hjelt (FINLAND)

The Working Group held its seventh Workshop on EM Induction in the Earth and Moon at the University of Ife, Nigeria in August 1984. These workshops attract around 100 registrants covering the whole field of EM studies both observational and theoretical and are a most important part of the activities of this Working Group. At the Nigeria meeting topics included electromagnetic induction risks in oil pipelines, a topic relevant to problems of interest in Nigeria. Other sessions concerned localised sources (both field studies and modelling techniques), induction studies in continental regions (including AM prospecting for natural resources), numerical modelling (including studies of characteristic dimensions), and global induction and the question of a reference electrical earth model.

Controlled sources were also under discussion including the powerful MHD generator injecting into the Barents Sea 15 x 10^3 Amperes in impulses of approximately 8-10 secs. The source is mathematically represented by both a grounded electrical dipole and circular current loops (closing in the sea) with radii increasing with time. Resulting inversion analyses compare favourably with results from nearby period ranges (AMT and MT). At Prague a half-day Symposium on EM sounding with controlled sources attracted considerable interest, with results showing the detail that can be achieved in mapping subsurface structures.

Magnetotelluric (MT) methods are being increasingly used in oil exploration, in geothermal fields and in mineral and groundwater exploration. Structural studies using AMT, MT and GDS techniques have all revealed the presence of a lower crustal conducting layer, whose coincidence with strong, seismic refractions is now drawing the attention of seismologists to the potential of EM induction techniques.

An intensive project in the group is the COMMEMI project (Comparision of Modelling Methods in EM Induction problems). The objective is to prepare a standard set of reliable programs of given and tested accuracy and to focus on directions for subsequent improvement. On the global induction front, it appears that the Earth's EM response, even at periods from a few hours to several tens of days, may be significantly affected by lateral variations in conductivity,

especially those associated with the oceans. Thus the Earth may not be spherically symmetrical and evidence from seismology and theories of convection would suggest lateral variations in conductivity down to at least 700 km depth.

Of special interest to this group is the Inter-Association (Working Group) on ELAS (Electrical Conductivity of the Asthenosphere). Under the ELAS umbrella the new major project EMSLAB is now underway. The part of the EMSLAB (Electromagnetic Sounding of the Lithosphere and Asthenosphere Beneath) of direct interest to the group concerns a dense array of magnetometers both on land and on the ocean floor from the Juan de Fuca ridge to the North American continent through the subduction zone.

An International Library of Numerical Modelling (ILONEM) is being set up at the University of Oulu, Finland, to operate as a library and computer centre at which induction programs can be tested and run, to which visitors could come to perform computations and to which data could be sent for modelling from Institutes with insufficient computer power.

This very active Working Group will be holding its next Workshop on EM Induction in the Earth and Moon at Neuchatel, Switzerland, 24-31 August 1986.

WGI-4: Magnetic anomalies (Land and Sea)

Chairman:	P Hood	(CANADA)
Vice-Chairman:	W J Hinze	(USA)

A major activity of the group is related to co-ordinating the production of unified magnetic anomaly maps of continental regions. The first major effort is the compilation of the Magnetic Anomaly Map of North America being prepared as a contribution to the Decade of North American Geology project of the Geological Society of America. Much progress has been made in the digitisation of the available aeromagnetic data and coloured Applicon maps have been prepared for both the United States and Canada which form the nucleus of the map. The next step is to merge the two maps together to a common datum. Unfortunately the relevant agencies in Mexico have not been able to produce a magnetic anomaly map for that country and there is considerable doubt whether one will be forthcoming in time for the Mexican data to be included on the North American map. Much progress has also been made in the cataloguing of the available marine magnetic data and J R Heirtzler has been the co-ordinator for this particular activity. A number of special aeromagnetic tie lines have been flown by the Canadian government both in Canada in offshore areas between Greenland and Canada and in the Caribbean. These should assist considerably in bringing the data to a common datum.

A magnetic anomaly map of Western Europe is also being planned, but not much progress has been made because of lack of offical and financial support. The possibility of extending the map into eastern Europe is being looked into. Other unified magnetic anomaly maps being considered for preparation include a coloured regional aeromagnetic map of southern Africa by the International Institute for Aerospace Surveys and Earth Sciences at Delft, Holland. In Australia a complete aeromagnetic anomaly map of the continent is being prepared by the Bureau of Mineral Resources, Canberra.

WGI-5: Palaeomagnetism

Chairman:	D A Valencio	(ARGENTINA)	1981-85
	C E Barton	(AUSTRALIA)	1985-89
Vice-Chairman:	C E Barton	(AUSTRALIA)	1981-85
	I G Pacca	(BRAZIL)	1985-89

Activity in this Working Group has concentrated in the past few years on three main topics. The analysis of vector directions during demagnetisation procedures has been the subject of much work and a lively symposium on this topic took place at Prague. Input from statistical experts has been an essential ingredient, but not at the expense of the physical interpretation. It appears that procedures have now reached a level of sophistication that one or two standard options are emerging.

A renewed interest in palaeointensity determinations has been evident, especially for archaeomagnetic studies. It has been proposed that much of previous work in this field using the Thellier double heating method is essentially incorrect because of possible magnetochemical changes that might occur during the experimental stages. The consensus is that this is not the case, because the results from other (different) techniques, such as that proposed by Shaw, tend to agree with those derived by the Thellier method. The topic is now in a lively discussion stage as shown by the symposium on the subject at Prague.

The renewed interest in palaeointensity determinations is one side effect of the continuing dialogue between palaeomagnetists and dynamo theoreticians. This dialogue continued at Prague with both sides becoming more aware of the nature of theory and experiment and how palaeomagnetic data might provide constraints to dynamo theories.

Late Precambrian and Palaeozoic reconstructions were the subject of an extremely successful Poster Session at Prague. Of particular interest was the display prepared by the Institute of Oceanology, Moscow, which saw a steady stream of visitors. This enabled a very successful dialolgue to take place between the enthusiastic Soviet workers in this field and those from western countries. It was a pleasure to see the

rapid acknowledgment of plate tectonics and advances that are being made in the Soviet Union through analysis of palaeomagnetic data to determine past reconstructions.

WGI-6: Rock Magnetism

Chairman: S K Banerjee (USA)
Vice-Chairman: H C Soffel (FRG)

The whole subject of rock magnetism is enjoying something of a renaissance at the present time. Indeed at the Prague Assembly, symposia organised by this group were always very heavily attended. The main aspects of current work include the combination of a rigorous theoretical and experimental physics approach, along with a realistic appreciation of the relevant areas of modern mineralogy and petrology.

The heart of rock magnetism lies in the properties of extremely small magnetic grains of size 100A to 1 micron. Techniques of crystal growth such as hydrothermal recrystallisation, precipitation in a glass matrix, flux growth etc., have been used to produce new families of dispersed fine-grained single crystals with highly controlled composition and internal stress. The observed magnetic properties are so different from the crushed and sieved grains studied in the past that the whole subject has been turned upside down. A special pre-Assembly Workshop [see pages XX-XX] was held during which lively discussions took place about the best ways to simulate the magnetic grains that carry remanent magnetism in nature.

There has been a rapid growth in the application of electronoptical techniques to natural and synthetic samples, including scanning and transmission electron microscopy, back-scattered X-ray diffraction, and electron and ion microprobe analysis. An area of lively interest is the direct observation of magnetic domains in grains of only 1 micron size. Magnetic colloids are used in specially prepared strain-free surfaces of natural and synthetic magnetic grains in order to reveal regions of simple and complex patterns. Temperature dependences of these patterns, along with new and more realistic calculations of minimum energy states in magnetic grains are leading to clear understanding of when and how stable components of remanent magnetisation are acquired on cooling, and how they change with time, or with reheating. The interpretation of the magnetic anisotropy of rocks in terms of palaeostress and paleoflow structures is another developing field.

Division I sessions.

01.01 Theoretical constraints, predictions and applications.
(Chairman: D P Zidarov)

01.01.01 ERROR ANALYSIS OF GEOMAGNETIC FIELD MODELS
R A Langel, R H Estes

01.01.02 MODELLING CURRENTS AT SATELLITE ALTITUDES
George Backus

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01.09.14 THERMAL DEMAGNETIZATION WITH MEASUREMENTS AT HIGH TEMPERATURE
J R Dunn, M Fuller

01.09.15 ESSENTIAL STRUCTURAL CORRECTIONS FOR PALEOMAGNETISM IN OROGENIC AREAS
B Henry

01.09.16 FUNERAL PYRES AND KITCHEN OVENS AS ARCHEOMAGNETIC RECORDERS?
M E Evans, Marianne Mareschal

01.09.17 THE INFLUENCE OF MAGNETIC REFRACTION ON TRM-DIRECTION IN KILNS
K Schurr, H C Soffel

01.10 Paleofield behaviour and core processes.
(Chairman: K A Hoffman)

01.10.01 USING PALEOMAGNETIC DATA TO LEARN ABOUT CORE PROCESSES
Ronald T Merrill

01.10.02 TOPOLOGICALLY AXISYMMETRIC AND NON-AXISYMMETRIC MAGNETIC FIELDS AND SELF-EXCITING MAGNETOHYDRODYNAMIC DYNAMO ACTION
Raymond Hide

01.10.03 REFLECTIONS ON REVERSALS IN THE GEOMAGNETIC FIELD
Leroy R Alldredge

01.10.04 A CONSTRAINT ON GEODYNAMO ENERGY SOURCES FROM REVERSAL DATA
P L McFadden, R T Merrill

01.10.05 INFERENCES FROM DISK DYNAMO MODELS
M Kono, M Shimizu

01.10.06 GEOMAGNETIC REVERSALS - STOCHASTIC EXCITATION OR CHAOTIC BEHAVIOUR?
D J Crossley, O G Jensen, J A Jacobs
(Chairman: P L McFadden)

01.10.07 LONG TERM (10000 YEAR) MEMORY IN THE EARTH´S CORE DYNAMO PROCESS
Steve P Lund, Thomas L Henyey, Joseph C Liddicoat, Ken Lajoie

01.10.08 GEOMAGNETIC DRIFT AS A FUNCTION OF AGE AND FREQUENCY [New title: DRIFT OF PALEO-GEOMAGNETIC FIELD FOR DIFFERENT TIME WINDOWS AND FREQUENCY BANDS]
K M Creer, G Smith
PALEOINTENSITY OF THE GEOMAGNETIC FIELD DURING THE MIOCENE REVERSAL RECORDED IN THE STEENS BASALT (OREGON)
M Prevot, E A Mankinen, C S Gromme, R S Coe

01.10.10 MODELLING POLARITY TRANSITIONS WITH RADIAL DIPOLE SOURCES
Alen Kaiser, Kenneth L Verosub

01.10.11 INVARIANT AND CHANGING TRANSITIONAL FIELD CHARACTERISTICS IN A SEQUENCE OF GEOMAGNETIC REVERSALS OF UPPER TORTONIAN AGE [New title: EVOLUTION OF THE TRANSITIONAL FIELD CONFIGURATION IN A SEQUENCE OF GEOMAGNETIC REVERSALS]
J P Valet, C Laj (+ P Tucholka)

01.10.12 SUCCESSIVE GEOMAGNETIC REVERSALS OF UPPER OLIGOCENE AND MIDDLE MIOCENE AGE [New title: PALEOMAGNETIC RECORDS FOR OLIGOCENE AND MIDDLE MIOCENE REVERSALS OBTAINED FROM MARINE CLAYS ON GREECE]
S Guitton, C Laj, C Kissel (+ J P Valet)

01.10.13 GEOMAGNETIC REVERSAL AS SEEN FROM MID-SOUTHERN LATITUDES
Kenneth A Hoffman

01.10.14 A RENEWED INVESTIGATION OF THE PALEOMAGNETIC FIELD BEHAVIOUR RECORDED BY THE PLIOCENE, LOUSETOWN CREEK FM OF NEVADA USA
N Roberts, R Weeks, M Fuller

01.10.15 PALEOMAGNETIC CONSTRAINTS ON THE REVERSING GEODYNAMO
M Prevot, R S Coe, E A Mankinen, C S Gromme

01.10.17 TRANSITIONAL FIELDS RECORDED IN A LAVA SEQUENCE FROM HUAHINE, POLYNESIA
P Roperch, N Bonhommet, L Chungue

01.10.18 THE VGP'S DISPLACEMENTS DURING REVERSALS
G N Petrova, G V Rassanova

01.10.19 PALEOFIELD BEHAVIOUR DURING THE LAST 3.4 MILLION YEARS
A Koci

01.11 Laurasian paleomagnetism and tectonics.
(Convenors: L P Zonenshain, D V Kent and Miroslav Krs)

POSTER SESSION

01.11.01 ACCRETION OF HERCYNIAN EUROPE TO LAURASIA
H Perroud, N Bonhommet, R van der Voo

01.11.03 THE PALEOBLOCKS OF ASIA IN PERMIAN TIMES
M W McElhinny

01.11.04 ACCRETION OF SOUTHERN ALASKA
John W Hillhouse

01.11.05 PALEOMAGNETISM OF SOME PALEOZOIC FORMATIONS FROM SOUTH CHINA
D V Kent, N D Opdyke, Zhang WenYou, Huang K, Xu G, Zeng X

01.11.06 PALEOMAGNETIC RESULTS FROM THE CRETACEOUS AND TRIASSIC OF THE YANGTZE PLATFORM
N D Opdyke, K Huang, G Xu, W Y Zhang, D V Kent

01.11.07 PALEOMAGNETIC RESULTS FROM ADJACENT TECTONIC PROVINCES IN GREECE
H B Turnell

01.11.08 PALAEOMAGNETISM AND PALAEOGEOGRAPHY OF THE ORDOVICIAN AND CAMBRIAN OF THE BARRANDIAN, BOHEMIAN MASSIF
M Krs, M Krsova, P Pruner

01.11.14 FOSSIL MAGNETISM OF THE LOWER DEVONIAN SANDSTONES FROM HOLY CROSS MTS, CENTRAL POLAND - PART I
E Halvorsen, M Jelenska, M Lewandowski

01.11.15 ASPECTS OF PRE-TERTIARY PALEOMAGNETISM OF SPITSBERGEN AND THEIR TECTONIC IMPLICATION
M Jelenska

01.11.16 POLE POSITIONS AND POLARITY IN THE JURASSIC FOR POLAND AND BULGARIA
J Kruczyk, M Kadzialko-Hofmokl

13.13.98 TECTONIC ROTATIONS SE OF THE BOHEMIAN MASSIF AS INDICATED BY THE PALAEOMAGNETIC DIRECTIONS OF PERMIAN RED BEDS FROM THE BALATON HIGHLANDS AND THE MECSEK MOUNTAINS, HUNGARY
Emo Marton, Donald P Elston

13.13.25 THE USE OF PALEOMAGNETIC DATA IN STUDYING THE PRECAMBRIAN TECTONICS
L J Pesonen, S Laehde, M A H Leino

LATE PRECAMBRIAN CONTINENTAL RECONSTRUCTIONS
A S Monin, L P Zonenshain, A M Gorodnitsky, V G Kazmin, M V Kononov, E A Nazarova

01.12 Magnetic carriers, domain structure and the origin of remanence.
(Chairman: C A Lawson)

01.12.01 MAGNETIC DOMAIN STRUCTURE AND FINE-PARTICLE BEHAVIOR
S Halgedahl

01.12.02 DOMAIN OBSERVATIONS ON FINE PARTICLES OF TITANOMAGNETITES DURING TRM ACQUISITION, THERMAL DEMAGNETIZATION AND HYSTERESIS
M Metcalf, M Fuller

01.12.03 STRESS ANISOTROPY IN TITANOMAGNETITES
E Appel, H C Soffel

01.12.04 ON THE THEORY OF THE LOWRIE-FULLER TEST
V P Shcherbakov

01.12.05 MICROMAGNETIC STUDIES OF PSEUDO-SINGLE DOMAIN STRUCTURE
R J Enkin, D J Dunlop

01.12.06 THE LINEARITY OF MAGNETIC SUSCEPTIBILITY
Guy M Smith, Subir K Banerjee

13.14.27 APPARENT SD-SP BEHAVIOUR OF COARSE SYNTHETIC TITANOMAGNETITES HAVING AN OBSERVED DOMAIN STRUCTURE
E R Deutsch, G S Murthy, R R Paetzold

01.12.08 ESTIMATION OF MAGNETIC DOMAIN STRUCTURE IN OCEANIC BASALTS USING THERMAL ACTIVATION PROCESS
M Prevot, M Bina

01.12.09 MAGNETOSTRICTIVE CONTROL OF COERCIVE FORCE AND SUSCEPTIBILITY IN ROCKS BEARING MULTIDOMAIN MAGNETITE
J P Hodych

(Chairman: G M Smith)

01.12.10 DOMAIN CONFIGURATION CHANGE ON COOLING OF PTRM IN MD MAGNETITE?
N Sugiura, E McClelland Brown

01.12.11 VIOLATION OF ADDITIVITY OF PTRM IN LARGE MULTIDOMAIN MAGNETITE
E McClelland Brown, N Sugiura

01.12.14 A PULSED FIELD TECHNIQUE FOR THE STUDY OF MAGNETIC GRAINS IN ROCKS
C Radhakrishnamurty, S D Likhite

01.12.15 VIBRATING-SAMPLE MAGNETOMETRIC METHOD AND ITS APPLICATION IN THE STUDY OF MAGNETIC PROPERTIES OF ROCKS
T Zelinka, P Hejda, V Kropacek

(Chairman: H C Soffel)

01.12.17 CHEMICAL REMANENT MAGNETIZATION (CRM) RESULTING FROM MAGHEMITE HEMATITE INVERSION
O Ozdemir, D J Dunlop

01.12.18 THE SOME PROPERTIES OF CRM OF MAGNETITE FORMED BY LOW TEMPERATURE UNMIXING OF TITANOMAGHEMITE
Nguyen Thi Kim Thoa, D M Pechersky

01.12.19 THE CHIEF PECULIARITIES OF CRYSTALLIZATION MAGNETIZATION OF MAGNETITE
Nguyen Thi Kim Thoa, D M Pechersky

01.12.20 PECULIARITIES OF SINGLE-PHASE OXIDATION OF MAGNETITE
A K Gapejev, S K Gribov

01.12.22 CHANGE IN TRM AND ARM IN A BASALT DUE TO LABORATORY HEATING
Masuru Kono

01.12.23 A PHENOMENOLOGICAL EXPLANATION OF SELF-REVERSAL IN ILM-HEM
Charles A Lawson, Gordon L Nord Jr, Duane E Champion

01.12.24 CAN EXSOLUTION CAUSE SELF-REVERSAL?
Bruce M Moskowitz, Charles A Lawson, Robert B Hargraves

01.12.25 EVOLUTION OF THE MAGNETIC PROPERTIES OF BASALTIC ROCKS FROM OCEANIC LAYER 2, AS A RESULT OF LOW TEMPERATURE OXIDATION
B M Smith

01.12.27 THE DRM DIAGNOSTICS IN SEDIMENTS
A Vardanian, T Nechaeva, G Petrova

01.12.29 ON THE PHYSICS OF ACQUISITION OF POST-DEPOSITIONAL REMANENT MAGNETIZATION
V P Shcherbakov, V V Shcherbakova

01.12.30 MAGNETIC PROPERTIES OF HYDROTHERMALLY GROWN MAGNETITE
Franz Heider, Taras Bryndzia, D J Dunlop

01.12.31 MAGNETIC PROPERTIES OF FINE TITANOMAGNETITE PARTICLES PRECIPITATED IN A SILICATE MATRIX
H U Worm, H Markert

01.12.32 BIOGENIC MAGNETITE IN MARINE SEDIMENTS
J L Kirshvink, S R Chang, J F Stolz

01.13 Paleointensity methods and results.
(Chairman: M J Aitken)

01.13.01 RECENT FIELD INTENSITIES
Mark Boyd
01.13.02 VARIATIONS IN THE GEOMAGNETIC FIELD IN SICILY: 1169-1983
Tim Rolph, John Shaw
01.13.03 PALEOINTENSITIES FROM SIX ITALIAN KILNS
M E Evans
01.13.04 PALEOINTENSITIES IN ARCHAEOMAGNETIC METHOD
K Ramaswamy, M Dheenathayalu, S Barathan
01.13.05 THE VARIATION OF ANCIENT GEOMAGNETIC FIELD'S INTENSITY FOR THE TERRITORY OF HUNGARY
S P Burlatskaya, P Marton, E Marton
01.13.06 REVISED ARCHAEOINTENSITY DATA FROM BULGARIA
M Kovacheva
01.13.07 PALEOINTENSITIES IN PERU FROM PRE-INCA POTSHERDS
N Ueno, M Kono
01.13.08 ARCHEOMAGNETIC RESULTS FROM FINNISH BRICKS AND POTSHERDS
L J Pesonen, M A H Leino
01.13.31 VARIATION OF THE GEOMAGNETIC FIELD INTENSITY DEDUCED FROM THE ARCHEOLOGICAL OBJECTS IN JAPAN
Hideo Sakai, Kimio Hirooka
01.13.10 ARCHEOMAGNETIC INTENSITY RESULTS SPANNING THE LAST 5000 YEARS
M J Aitken, A L Allsop, G D Bussell, M Winter
01.13.11 PALEOINTENSITY OF THE EMF BETWEEN 7000BP - 13000BP
N Bonhommet, S Salis, S Levi
01.13.12 HIGH VALUE OF THE EMF INTENSITY AT ST SATURNIN (8800 BP) FRANCE
J S Salis, N Bonhommet, F Calza
01.13.13 PALEOINTENSITY OF THE HOLOCENE GEOMAGNETIC FIELD IN WESTERN NORTH AMERICA
Kenneth L Verosub

(Chairman: K L Verosub)

13.14.25 COSMOGENIC 10BE PROFILES ACROSS MAGNETIC REVERSAL BOUNDARIES IN TWO MARINE SEDIMENT CORES
G M Raisbeck, F Yiou, D Bourles, D Kent
01.13.15 MINERAL ALTERATION AND ITS EFFECTS ON PALEOINTENSITIES
D Walton

(Chairman: John Shaw)

01.13.17 EFFECT OF COOLING OF IGNEOUS ROCKS ON CHANGES OF THE PALEOINTENSITY IN CONTACT ROCKS
J Bochnicek, P Hejda, V Kropacek

01.13.18 EXPERIMENTAL ERRORS IN PALEOINTENSITY DETERMINATION
M Kono, H Tanaka

01.13.19 ARCHEOMAGNETIC USE OF THE THELLIER TECHNIQUE: RELIABILITY, ACCURACY, COMPARISON WITH SHAW
M J Aitken, A L Allsop, G D Bussell, M Winter

13.14.33 DIAGENETIC ALTERATION OF MAGNETIC MINERALS IN SEDIMENTS - THE BANE OF RELATIVE PALEOINTENSITY STUDIES
Robert Karlin, Shaul Levi

(Chairman: M Kono)

01.13.22 PALEOINTENSITY DETERMINATIONS OF LUNAR SAMPLES
S M Cisowski, M Fuller

01.13.24 PALEOINTENSITY OF GEOMAGNETIC FIELD DETERMINED FROM ROCK TYPES OF WEST CARPATHIANS
I Tunyi

01.13.25 INTENSITY AND DIRECTION OF MIDDLE DEVONIAN AND EARLY ORDOVICIAN GEOMAGNETIC FIELD OF SEDIMENTARY ROCKS BAKED BY BASALT LAVA FLOWS AND SILLS, MUGODGARY, SOUTHERN URALS
K S Burakov, A N Didenko, D M Pechersky

01.13.26 PALEOINTENSITY DETERMINATIONS ON THE MIOCENE OF NEW ZEALAND
Graham J Sherwood, John Shaw

01.13.29 PALEOINTENSITIES OF PRECAMBRIAN ROCK FORMATION IN TAMILNADU DURING REVERSAL
K Ramaswamy, S Ramamurthy

01.13.30 PALEOINTENSITIES OF SEDIMENTARY FORMATIONS IN NEYVELI LIGNITE MINES WITH SPECIAL REFERENCE TO REVERSALS
K Ramaswamy, D Shanmugasundaram

SELECTION OF BASALTS FOR PALEOINTENSITY STUDIES
C Radakrishnamurty

SOME REMARKS ABOUT PALEOINTENSITY DURING REVERSALS
G N Petrova

01.14 Magnetic fabric studies.
(Chairman: J-J Wagner)

01.14.01 MEASUREMENT OF SUSCEPTIBILITY ANISOTROPY WITH THE SCHONSTEDT MAGNETOMETER
H Perroud, J P Cogne, M P Texier

01.14.02 AN AUTOMATED TORQUE METER FOR RAPID MEASUREMENT OF HIGH-FIELD MAGNETIC ANISOTROPY OF ROCKS
V Jelinek, J Parma

01.14.03 RESOLUTION OF FERROMAGNETIC AND PARAMAGNETIC ANISOTROPY COMPONENTS, USING LOW-FIELD AND HIGH-FIELD MEASUREMENTS
F Hrouda, V Jelinek

01.14.04 STRAIN TO ANISOTROPY CORRELATIONS - CORRECTED FOR THE DIGICO CALIBRATION ERROR
J S Rathore

01.14.05 STRESS-INDUCED ANISOTROPY OF LOW FIELD MAGNETIC SUSCEPTIBILITY
A Kapicka

01.14.06 MEASUREMENT OF MAGNETIC SUSCEPTIBILITY ANISOTROPY IN BUNTSANDSTEIN DEPOSITS FROM SOUTHERN GERMANY
Th Schultz-Krutisch, F Heller

01.14.07 PETROPHYSICAL INVESTIGATION OF COMPLEX SUSCEPTIBILITIES IN ROCKS RELATED TO ANISOTROPY OF MAGNETIC SUSCEPTIBILITY (AMS) INTERPRETATION
P Rochette, G Lamarche

01.14.08 COMPACTIONAL AND TECTONIC MAGNETIC FABRICS IN THE SCAGLIA ROSSA LIMESTONE
W Lowrie, A M Hirt

01.14.09 MAGNETIC FABRIC IN BIOTURBATED SEDIMENTS
Brooks B Ellwood

01.14.10 MAGNETIC ANISOTROPY OF RETROGRESSIVELY METAMORPHOSED GNEISSES OF THE HRUBY JESENIK MTS
M Chlupacova, P Pruner, J Chab

01.14.11 CHANGES OF MAGNETIC SUSCEPTIBILITY ANISOTROPY IN METAMORPHIC ROCKS OF THE SCHIRMACHER OASIS (ANTARCTICA) AS A METHODICAL CONTRIBUTION TO THE ANALYSIS OF CATACLASTIC DEFORMATION PROCESSES
V Damm, K Rother, G Andreks

01.14.12 MAGNETIC ANISOTROPY AND FABRIC OF METAMORPHIC ROCKS, SOUTHERN APPALACHIANS, USA
L L Brown, A G Goldstein

01.14.05 A MAGNETIC FABRIC STUDY TO DETERMINE THE MODE AND TIME OF EMPLACEMENT OF THE SHAP GRANITE IN THE ENGLISH LAKE DISTRICT [Abstract number shows a misprint, .05 instead of .15]
J S Rathore, A M Kafafy

01.14.16 MAGNETIC ANISOTROPY AND POROSITY OF CHONDRITES
N Sugiura, D W Strangway, T Matsui

01.14.18 THE SUDBURY BASIN: A DEFORMATION STUDY USING MAGNETIC SUSCEPTIBILITY ANISOTROPY (MSA)
A M Hirt, W Lowrie, R Kligfield, W S Clendenen

01.14.19 COAXIALLY ORIENTED MAGNETIC FABRICS IN METAMORPHIC, GRANITIC AND SEDIMENTARY ROCKS AND THEIR THRUSTING CONTROL
F Hrouda

01.14.20 A FABRIC STUDY IN THE FRENCH ARDENNES AND A COMPARISON OF MAGNETIC, MICA AND STRAIN FABRIC AXES
J S Rathore, H Hugon

01.14.21 DIRECT FIELD-INDUCED ANISOTROPY OF INITIAL SUSCEPTIBILITY IN HEMATITE ORES
K Zapletal

01.14.24 MAGNETIC FABRIC OF LAVA FLOWS
J-J Wagner, I G Hedley, Cl Gagny

POSTER SESSION

01.14.25 ANALYSIS OF MAGNETIC ANISOTROPY IN THE MAGGIA NAPPE, LEPONTINE ALPS, SWITZERLAND
A M Hirt, W Lowrie

01.14.26 THE MAGNETIC FABRICS OF EGLETONS GRANIT (FRANCE): METHODOLOGICAL AND STRUCTURAL IMPLICATIONS
B Henry

01.14.28 SOME MAGNETIC ANISOTROPY DATA IN GEOLOGICAL AND PALAEOMAGNETIC CONTEXT
S C Radan, M Radan

01.15 Reconciliation of magnetic measurements on natural and synthetic materials.
(A) DRM and small particles
(Chairman: Steve Lund)

01.15.02 COMPACTION SHALLOWING OF A SYNTHETIC PDRM
K P Kodoma, G L Anson

01.15.03 PALEOMAGNETIC EVIDENCE FROM NATURAL SEDIMENTS FOR THE LACK OF A SYSTEMATIC INCLINATION ERROR
Steve P Lund, Thomas L Henyey

01.15.04 REMANENCE OF LABORATORY-REDEPOSITED LAKE SEDIMENTS
Shaul Levi, Subir K Banerjee

01.15.05 MAGNETIC HYSTERESIS PROPERTIES AND ANHYSTERETIC REMANENT MAGNETIZATION OF SPHERICAL FE3O4 PARTICLES IN THE GRAIN SIZE RANGE 0.05 - 0.15 MICRONS
E Schmidbauer, N Schambera

01.15.06 COMPARISON OF HYSTERESIS LOOPS OF SYNTHETIC SAMPLES WITH VARYING CONTENTS OF MAGNETITE AND HEMATITE
H Mauritsch, M Becke, P Hejda, V Kropacek, T Zelinka

01.15.07 BACTERIAL MAGNETITE AS CARRIER OF NATURAL REMANENT MAGNETIZATION IN DEEP SEA SEDIMENTS
T von Dobeneck, N Petersen, H Vali

(B) Titanomagnetites
(Chairman: Nikolai Petersen)

01.15.08 RECONCILIATION OF LOW-TEMPERATURE HYSTERESIS AND SUSCEPTIBILITY MEASUREMENTS FROM BASALTS WITH THOSE FROM SYNTHETIC TITANOMAGNETITES
M W McElhinny

01.15.09 VISCOUS MAGNETIZATION IN INTERACTING FINE PARTICLES OF MAGNETITE
D J Dunlop, R J Enkin, D Walton

01.15.10 PREPARATION AND CHARACTERIZATION OF TITANOMAGNETITE PRECIPITATES IN SILICATES
H U Worm, H Market

01.15.11 THE PRODUCTION OF TITANOMAGNETITE SINGLE CRYSTALS BY FLUX GROWTH
Guy M Smith

01.15.12 HYSTERESIS PROPERTIES OF CRUSHED MAGNETITES AND CRYSTALS GROWN FROM SOLUTION - CAN THEY BE RECONCILED?
D J Dunlop

01.15.13 THE EFFECTS OF THE INITIAL NON-STOICHIOMETRY OF TITANOMAGNETITE (TM60) ON THE CURIE TEMPERATURES OF TITANOMAGHEMITES
Bruce M Moskowitz

(C) Titanomagnetites (continued)
(Chairman: Subir Banerjee)

01.15.14 DIVERSITY OF TITANOMAGHEMITES: EFFECT OF CATION DISTRIBUTION?
M Kono, H Tanaka, T Nishitani

01.15.15 SYNTHETIC ANALOGS OF SUBMARINE TITANOMAGHEMITES
S K Banerjee, H-U Worm, D-W Suk

01.15.16 EFFECTS OF LOW TEMPERATURE OXIDATION ON THE DIRECTION OF REMANENCE IN FINE GRAINED OCEANIC BASALTS
S J Beske-Diehl

01.15.17 CHEMICAL REMANENT MAGNETIZATION (CRM) IN SYNTHETIC SD TITANOMAGHEMITES
O Ozdemir, D J Dunlop

01.15.18 CHEMICAL REMANENT MAGNETIZATION AFTER THE OXIDATION OF MAGNETITE
Franz Heider, D J Dunlop

01.15.19 FORMATION OF SHRINK CRACKS IN LOW TEMPERATURE OXIDIZED TITANOMAGNETITES
N Petersen, H Vali

(D) General
(Chairman: Vladimir Kropacek)

01.15.20 DISCREPANCIES BETWEEN EXPERIMENTAL OBSERVATIONS IN NATURAL AND SYNTHETIC SAMPLES
S A Vincenz

01.15.21 A CONTRIBUTION TO MAGNETIC PROPERTIES OF NATURAL COBALTITE
M Krs, V Kropacek

01.15.22 DOMAIN PATTERNS VS MEASURED BEHAVIOR IN MD TITANOMAGNETITES
S Halgedahl

01.15.23 GRAIN SIZE DEPENDENCE OF DOMAIN STATE AND MAGNETIC PROPERTIES
M Fuller

01.15.24 EFFECTS OF LARGE DEFORMATIONS ON REMANENCE OF ROCKS
J P Pozzi, J Besse

01.15.25 METHOD OF DETERMINATION OF CURIE POINT IN ROCKS AND SYNTHETIC SAMPLES
M Prevot

01.15.26 MODELLING HYSTERESIS DATA USING SIMPLEX
R Thompson

01.15.27 AN INEXPENSIVE PULSE-MAGNETIZATION SYSTEM FOR IRM ACQUISITION EXPERIMENTS
Joseph L Kirschvink

01.15.28 THE MAGNETIC PROPERTIES OF A TERTIARY IRONCRUST IN SE BELGIUM AND SYNTHETIC MN-SUBSTITUTED GOETHITES
W Stiers, J J Hus

01.16 General contributions.
(Chairman: M W McElhinny)

01.16.01 CUBIC APPROXIMATIONS OF DEFINITIVE GEOMAGNETIC REFERENCE FIELD MODELS
Leroy R Alldredge

01.16.02 1883-1983 SECULAR VARIATION OF THE EARTH'S MAGNETIC FIELD IN EUROPE
J Gavoret, D Gibert, M Menvielle, J L Le Mouel

(B) Paleo-secular variation and excursions
(Chairman: M W McElhinny)

01.16.07 A 650 YEARS ANNUAL PALEOMAGNETIC RECORD FROM LATE GLACIAL VARVES IN PATAGONIA, ARGENTINA
Claudio Sylwan

01.16.09 GEOMAGNETIC EXCURSIONS - ILLUSIVE, ELUSIVE AND REAL
C E Barton, M W McElhinny

01.16.10 A PALEOMAGNETIC STUDY OF SECULAR VARIATION IN THE MEXICAN NEOVOLCANIC BELT
E Herrero-Bervera, J C Guerrero

01.16.11 CHANGES IN THE GEOMAGNETIC FIELD AND CLIMATE
V Bucha

13.14.24 LATE-ALPINE DYNAMICS OF THE BULGARIAN LANDS AFTER PALEOMAGNETIC DATA
P Nozharov, N Petkina

01.16.13 CHINESE QUATERNARY MAGNETOSTRATIGRAPHY
J Shaw, T C Rolph, Wang Jingtai, E Derbyshire

01.16.14 MAGNETIZATION AND SEDIMENTATION HISTORY OF LOESS IN THE CENTRAL LOESS PLATEAU OF CHINA
F Heller, J Wang, H Li, T S Liu

01.16.15 PALEOMAGNETIC INVESTIGATIONS IN THE QUATERNARY OF THE BALTIC - FIRST RESULTS
K Rother

01.16.17 PALEOMAGNETIC EVIDENCE FOR ARCHEAN REVERSALS OF THE GEOMAGNETIC FIELD
P W Layer, M O McWilliams, A Kroner

01.16.18 TRUE POLAR WANDER FROM PALEOMAGNETIC, GEOID AND HOTSPOT DATA
P Marton

01.16.19 A MULTICOMPONENT PALEOMAGNETIC INVESTIGATION OF SOME OF THE DYKES WEST OF RAS GHARIB, EASTERN DESERT, EGYPT
K C Hare, A E M Nairu

01.16.20 PALEOMAGNETISM OF THE MESOZOIC SERRA GERAL FORMATION (SOUTHERN BRAZIL) AND ITS IMPLICATIONS TO THE BREAKUP OF WESTERN GONDWANA
M Ernesto, I G Pacca

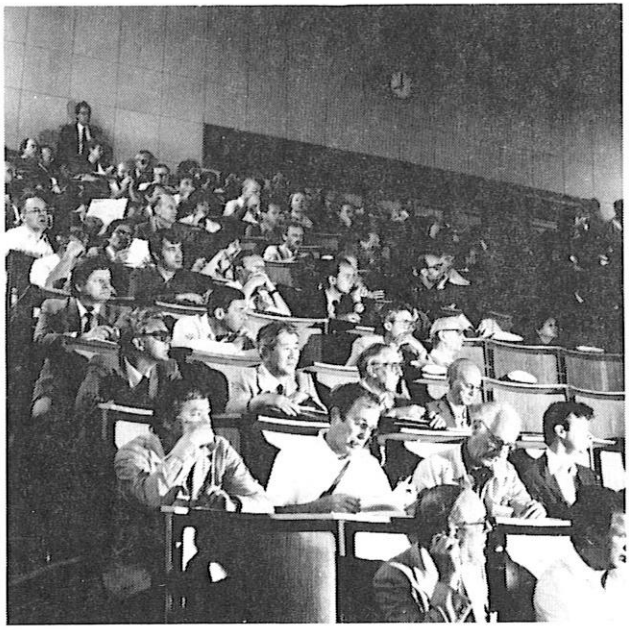
01.16.21 PALEOMAGNETISM AND TECTONICS IN THE UMBRIA-MARCHES APENNINES
A M Hirt, W Lowrie

01.16.22 ARCHEAN APPARENT POLAR WANDER RECORDED IN THE KAAPVAAL CRATON, SOUTHERN AFRICA
P W Layer, M O McWilliams, A Kroner

01.16.23 VERTICAL MOVEMENTS IN THE CANADIAN PRECAMBRIAN SHIELD DEDUCED FROM REMANENT MAGNETIZATION IN DYKE CONTACTS
E J Schwartz, K L Buchan

01.16.24 CONTACT GRANITIC ROCKS, XENOLITHS, AND THE RELATIVE DATING OF SECONDARY MAGNETIZATIONS IN ROCKS FROM THE ZENA-SAFAGA ROAD, EASTERN DESERT, EGYPT
A E M Nairu, R Ressetar, S Rodgers

01.16.25 PALEOMAGNETISM OF METAMORPHIC ROCKS FROM THE PIQUETE COMPLEX - SOUTHERN BRAZIL
M S D´Agrella Filho, K Sato, I G Pacca



Withdrawn papers:

01.01.12 GEOMAGNETIC MAIN FIELD MODELLING TO HIGH DEGREES AND ORDER USING THE FAST FOURIER TRANSFORM
J M Quinn

01.01.17 CHARACTERS OF THE 1969-1970 IMPULSE OF THE SECULAR ACCELERATION OF GEOMAGNETIC FIELD OVER CHINA AND ITS ADJACENT AREAS
Y H Wang, Y F Xu

01.01.18 RAPID AND EPISODIC VARIATION OF THE GEOMAGNETIC SECULAR VARIATION FIELD
H Mizuno

01.01.26 EARTHQUAKES, INNER-CORE OSCILLATION, AND THE GEOMAGNETIC DYNAMO
I J Won

01.04.10 ONE-DIMENSIONAL INVERSE PROBLEM OF MAGNETOTELLURIC SOUNDING
G V Molochnov, L N Porokhova, M M Kharlamov

01.06.17 DEEP ELECTROMAGNETIC STUDIES OF CARPATHYAN-BALANCYAN REGION
M S Zhdanov, Iv M Varentsov, V S Schneyer, S V Schabeljansky, I L Trofimov, S M Korotaev, N G Golubev, L M Abramova

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02.04.08 SATELLITE OBSERVATIONS OF LIGHTNING AND ASSOCIATED ELECTRON PRECIPITATION
H D Voss, W L Imhof, J Mobilia

02.04.09 MIDDLE ATMOSPHERIC RESPONSE TO LIGHTNING INDUCED MAGNETOSPHERIC ELECTRONS
R A Goldberg, J R Barcus, L C Hale, S A Curtis

13.14.36 POSITIVE AND NEGATIVE ION COMPOSITION MEASUREMENTS IN THE TROPOSPHERE AND LOWER STRATOSPHERE
G Hauck, F Arnold

02.04.11 CHARGED PARTICULATES IN THE MIDDLE ATMOSPHERE
J D Mitchell, C L Croskey

02.04.12 OBSERVATIONS OF SULFURIC ACID AEROSOL VARIATIONS IN THE POLAR MIDDLE ATMOSPHERE DURING LARGE TEMPERATURE FLUCTUATIONS
D J Hofmann, J M Rosen

02.05 Metallic atoms and ions.
(Convenor: J-P Jegou)

02.05.01 PHYSICS AND CHEMISTRY OF MIDDLE ATMOSPHERE METALS
F Arnold
SEARCH FOR GASEOUS METEOR ABLATION MATERIAL IN THE STRATOPAUSE REGION USING A NEW PARACHUTE-BORNE ION MASS SPECTROMETER
O Moehler, F Arnold

02.05.02 LIDAR MEASUREMENTS OF GRAVITY WAVE PARAMETERS AND TIDAL EFFECTS IN THE NA LAYER
C S Gardner, C F Sechrist Jr

02.05.03 SODIUM AND CALCIUM LAYERS BEHAVIOUR IN THE UPPER ATMOSPHERE
C Granier, J P Jegou, G Megie

02.05.04 ON THE ABUNDANCE OF METAL IONS IN THE LOWER IONOSPHERE
E Kopp, H Ramseyer

02.05.05 THE TWILIGHT SODIUM LAYER
V W J H Kirchhoff, P P Batista, B R Clemesha, D M Simonich

02.05.06 VARIATIONS IN THE COMPOSITION OF METALLIC IONS IN THE F2-REGION OF THE EQUATORIAL IONOSPHERE
J Smilauer, V G Istomin

02.05.07 MECHANISM FOR THE FORMATION OF DAYTIME BLANKETING (EBS) IONIZATION LAYERS AT THE EQUATOR
R Pandey, S Prakash POSTER SESSION

02.07 Remote mapping of auroral regions. Observation and interpretation. [Jointly with Div.III]
(Chairmen: Pekka Tanskanen and Yasha Feldstein)

02.07.01 AURORAL OBSERVATIONS FROM THE SPACE SHUTTLE
W F Denig, C P Pike, S B Mende, G R Swenson, D J W Kendall, E J Llewellyn

02.07.02 MODULATION OF AURORAL LATERAL DISTRIBUTION BY THE EARTH'S CRUST UNDERLAYING STRUCTURES
V P Samsonov, V G Vasilyeva, S Yu Vladimirov

02.07.03 OBSERVATIONS IN THE SOUTH ATLANTIC GEOMAGNETIC ANOMALY BY INTERCOSMOS-BULGARIA-1300 SATELLITE DURING A GEOMAGNETIC STORM
M M Gogoshev, Ts N Gogosheva, Iv N Kostadinov, T I Markov

02.07.04 INTERNAL MORPHOLOGY OF A PULSATING AURORA
J P S Rash, J B Clarke, M W J Scourfield

02.07.06 SIMULTANEOUS X-RAY IMAGERY, OPTICAL AND ENERGETIC PARTICLE OBSERVATIONS OF THE EARTH'S AURORA
H D Voss, W L Imhof, R R Vondrak

02.07.07 WAVE-INDUCED MICROBURST ELECTRON PRECIPITATION
R Wei, D L Detrick, T J Rosenberg, U S Inan

02.07.08 RELATIONSHIP BETWEEN THE DISCRETE AURORAL ARCS AND FIELD-ALIGNED CURRENTS, MEASURED BY SATELLITE "IC-BULGARIA-1300" AND THE POLAR ELECTROJETS
R G Kobilarov, M M Gogoshev, A Bochev, Ts N Gogosheva

02.07.09 AVERAGE HIGH-LATITUDE, FIELD-ALIGNED CURRENTS DERIVED FROM AN EMPIRICAL MAGNETOSPHERIC FIELD MODEL
Harlan E Spence, Margaret G Kivelson, Raymond J Walker

02.07.10 A MAGNETOHYDRODYNAMIC SIMULATION OF THE INTERACTION OF THE SOLAR WIND WITH THE MAGNETOSPHERE DURING INTERVALS WITH SOUTHWARD INTERPLANETARY MAGNETIC FIELD
Tatsuki Ogino, Raymond J Walker, Maha Ashour-Abdalla

02.07.11 SMALL-SCALE DYNAMICS OF THE POLAR CUSP AURORA AND THE LOCAL MAGNETIC FIELD
P E Sandholt, A Egeland, A Asheim, B Lybekk

02.07.12 CUSP REGION AURORAL IMAGING
D J McEwen

02.07.14 ON BIZONAL STRUCTURE OF AURORAL ZONE
V P Samsonov

02.07.15 AURORAL SURGE FORMS AND MID-LATITUDE SUBSTORM SIGNATURES
C Gelpi, H J Singer, W J Hughes

02.07.16 POLEWARD SURGES OF AURORAL PHENOMENA TO VERY HIGH LATITUDES
T J Rosenberg, E W Hones Jr, L J Lanzerotti, F T Berkey, R H Eather

02.07.17 BEHAVIOR OF THE AURORAS IN THE LATE STAGE OF SUBSTORMS
E W Hones Jr

02.07.18 E-REGION HALL CONDUCTANCE ESTIMATES AND THE IONOSPHERIC CLOSURE CURRENT
P J Wilkinson, E Nielsen

02.07.19 HILAT/EISCAT/STARE CASE STUDY OF F-REGION IRREGULARITIES IN THE NIGHTTIME AURORAL OVAL
Sunanda Basu, Santimay Basu, C Senior, H C Carlson, D H Hardy, F J Rich, E Nielsen

02.07.20 PLASMA CONVECTION IN THE MORNING AURORAL OVAL
T S Jorgensen

02.07.21 A SAFARI-EISCAT COMPARISON BETWEEN THE VELOCITY OF F-REGION SMALL-SCALE IRREGULARITIES AND THE ION DRIFT
J P Villain, C Hanuise, G Caudal

02.07.23 COMPARISONS OF JOVIAN AURORA BRIGHTNESS VARIATIONS WITH INFERRED LOCAL INTERPLANETARY CONDITIONS
J G Luhmann, T E Skinner, E J Smith

02.07.24 INTERPLANETARY FACTORS CONTROLLING THE VENUS AURORA
J L Phillips, J G Luhmann, A I F Stewart, A Barnes

AURORAL IMAGING WITH DE-1
J D Craven (et al.)

13.02.03 COMPARISON OF INCOHERENT SCATTER AND MAGNETOMETER MEASUREMENTS IN THE AURORAL ELECTROJET
H Kohl, H Luehr, J Otten

IONOSPHERICAL RESPONSE TO DAYTIME AURORAL ELECTRON PRECIPITATION
K Stamnes (et al.)

02.07 Remote mapping of auroral regions. Observation and interpretation. [Jointly with Div.III]
(Chairman: Pamela Rothwell)

02.07.26 EVOLUTION OF AURORAL REMOTE MONITORING
R H Eather

02.07.27 RECENT DEVELOPMENTS IN GROUND-BASED AURORAL OBSERVATIONS
R J Pellinen

02.07.28 COHERENT RADAR OBSERVATIONS OF THE HIGH LATITUDE IONOSPHERE
M W J Scourfield

02.07.29 ULTRAVIOLET AURORA FROM SPACE
R E Huffman

02.07.30 RESULTS OF AURORAL AND AIRGLOW OBSERVATIONS FROM ORBITAL STATIONS AND SATELLITE INTERKOSMOS-BULGARIA-1300
A K Kuzmin, L S Evlashin, M M Gogoshev

02.07.31 AURORAL OBSERVATIONS FROM THE ATMOSPHERIC AND DYNAMICS EXPLORER SATELLITES
L A Frank

02.07.32 REMOTE MAPPING OF THE AURORAL REGION USING X-RAY OBSERVATIONS
D J Gorney

(Chairman: J Luhmann)

02.07.33 PLANETARY AURORAL OBSERVATIONS
Thomas E Skinner

02.07.34 AURORAL FEATURES AND MAGNETOSPHERIC STRUCTURE
Yu I Galperin, Y I Feldstein

02.07.35 RELATIONSHIP BETWEEN THE AURORA AND THE STRUCTURE OF THE MAGNETOSPHERE (New title: AURORAL DISPLAY AND SOLAR TERRESTRIAL INTERACTION)
Syun-Ichi Akasofu

02.09 General contributions to Division II.
(Convenor: M H Rees)

02.09.01 A STATISTICAL STUDY OF THE SUBAURORAL ELECTRON TEMPERATURE ENHANCEMENT USING THE DYNAMICS EXPLORER-2 SATELLITE
J U Kozyra, T E Cravens, A F Nagy, L H Brace

02.09.02 PROPERTIES OF BRIGHT NIGHT AIRGLOW DISPLAYS
M J Taylor

02.09.03 SOME MORPHOLOGICAL FEATURES OF DEVELOPMENT OF AURORAL DISCRETE FORM FINE STRUCTURE ON TELEVISION OBSERVATION DATA IN TIXIE BAY
V A Velichko, N F Molochuskin, V P Samsonov

02.09.07 THE THEORY OF PERPENDICULAR IONOSPHERIC GRADIENTS IN THE NIGHTTIME F2-LAYER AT MIDLATITUDES
D J Melendez-Alvira, J C G Walker, R G Burnside

02.09.11 SPECTRAL ALBEDO OF VENUS AND NATURE OF UV EXCITATION
O G Taranova

02.09.12 OPTICAL DOPPLER IMAGING OF AIRGLOW AND AURORA
Gordon G Shepherd, J C Bird, W A Gault, E J Llewellyn, K V Paulson, P R Kosteniuk

02.09.13 TOTAL LOSS OF WATER VAPOR FROM VENUS
V A Krasnopolsky

02.09.14 ON LONG-TERM TRENDS OF IONOSPHERIC CHARACTERISTICS
P Dominici, B Zolesi

02.09.17 DETERMINATION OF IONOSPHERIC CHARACTERISTICS IN AND NEAR DIFFERENT TYPES OF AURORAL FORMS USING LOW LIGHT TV CAMERAS AND EISCAT
Pamela Rothwell

13.02.01 JULY 13, 1982 POLAR CAP ABSORPTION EVENT EFFECTS ON MESOPAUSE NEUTRAL WINDS AT POKER FLAT, ALASKA (65N)
R M Johnson, J G Luhmann

13.02.02 SEARCH FOR GASEOUS METAL COMPOUNDS IN THE STRATOSPHERE AND MESOSPHERE USING PASSIVE CHEMICAL IONISATION MASS SPECTROMETRY WITH HIGH MASS RESOLUTION
O Moehler, F Arnold

13.08.01 SOURCES AND SINKS OF ATMOSPHERIC (H, HE, C, N, O) ATOMS
G M Martynkevich

13.13.69 AN ULTRAVIOLET AURORAL IMAGER FOR THE VIKING SATELLITE
C D Anger, R A King, J S Murphree

13.14.38 THE VUV-VIS THERMOSPHERIC DAYGLOW FROM SPACELAB 1
Marsha R Torr, D G Torr

IONOSPHERIC RESPONSE TO DAYTIME AURORAL ELECTRON PRECIPITATION: RESULTS AND ANALYSIS OF A COORDINATED EXPERIMENT BETWEEN AUREOL-3 SATELLITE AND EISCAT RADAR
K Stamnes, S Perraut, J M Bosqued, M H Rees, B A Emery, R G Roble

Papers withdrawn from Division 2 sessions:

02.01.01 MODEL CALCULATIONS OF THE MID AND LOW LATITUDE TERRESTRIAL THERMOSPHERE
David Rees

02.01.02 HEATING EFFICIENCIES IN THE TERRESTRIAL THERMOSPHERE
D G Torr, M R Torr, P G Richards

02.01.03 WAVE PROPAGATION IN THE THERMOSPHERE AS SIMULATED WITH A THREE DIMENSIONAL TIME-DEPENDENT GLOBAL MODEL
David Rees, Timothy L Killeen, T J Fuller-Rowell

02.01.06 ANALYSIS AND COMPARISON OF SEMI-EMPIRICAL MODELS OF THE LOWER THERMOSPHERE
P W Blum, K G H Schuchardt, W Kurtsiefer, A Neumann

02.01.07 UPPER ATMOSPHERE COMPOSITION AND THE TURBULENT DIFFUSION COEFFICIENT IN A SIMULTANEOUS CALCULATION
M K Ivelskaya, V V Katyushina, N N Klimov

02.01.05 EVIDENCE FOR LARGE-SCALE EDDY STRUCTURES IN THE UPPER ATMOSPHERE FROM IONOSPHERIC DATA [Abstract number shows a misprint, ".05" instead of ".25"]
N I Dvinskikh, N N Klimov, N Ya Naidenova

02.02.02 N2+ VIBRATIONAL EMISSION IN THE DAYGLOW
D G Torr, M R Torr, A Khoyloo, P G Richards

02.02.05 INVESTIGATION OF HYDROXYL EXCITATION PROCESSES WITH ROCKET AND GROUND MEASUREMENTS
K D Baker, J C Ulwick, D J Baker, K U Grossmann

02.02.30 ROCKET MEASUREMENTS OF NITROGEN EMISSIONS IN THE AURORA IN NEAR-ULTRAVIOLET
O I Yagodkina, V G Vorobjev, L S Yevlashin

02.02.31 ENERGY ASPECT OF EXCITATION OF ELECTRON-VIBRATIONAL STATES OF N2, O2, O BY ELECTRON IMPACT
G A Ivanov, A S Kirillov, V E Ivanov

02.02.32 THE SWINGS EFFECT IN THE N2+ FIRST NEGATIVE BANDS
V Degen

02.02.33 ELECTRON CONCENTRATION AND EXCITATION OF MAIN AURORAL EMISSIONS IN DIFFUSE AURORAL ZONE
Yu I Galperin, S I Belinskaya, N N Klimov, V L Khalipov

02.02.34 A NARROW AURORAL ARC OBSERVED WITH EISCAT
M A Hapgood, B S Lanchester

13.14.08 ELECTRON TEMPERATURE CHARACTERISTICS OF THE HIGH LATITUDE F-REGION
M Singh, E P Szuszczewicz

13.13.45 RELATIVISTIC DISPERSION MODIFICATIONS TO THE CYCLOTRON MASER THEORY OF AURORAL KILOMETRIC RADIATION
P L Pritchett, R J Strangeway

13.13.74 A REVIEW OF EQUATORIAL PLASMA PROCESSES CONTRIBUTING TO SPREAD F: THEORY AND NUMERICAL SIMULATION
S L Ossakow, S T Zalesak

13.13.59 MEDIUM SCALE TID'S
H Kelder, T A Th Spoelstra

13.14.18 SIMULATION OF AURORAL POTENTIAL STRUCTURES AND RELATED PHENOMENA
H Thiemann, N Singh, R W Schunk

02.07.05 SIMULTANEOUS OBSERVATIONS OF AURORAL OPTICAL EMISSIONS AND BREMSSTRAHLUNG X-RAYS
J S Murphree, D Varga Venkatesan, L L Cogger, C D Anger

02.07.13 THE DAYSIDE AURORAL OVAL AS A MIRROR IMAGE OF PROCESSES IN THE DAYSIDE/FLANK BOUNDARY LAYER
Rickard Lundin

02.07.22 PLASMAPAUSE AND AURORAL F LAYER IRREGULARITIES OBSERVED BY SCINTILLATION OBSERVATIONS
J Aarons

02.07.25 OBSERVATIONS OF PLANETARY AURORA WITH THE HUBBLE SPACE TELESCOPE
John T Clarke

02.09.04 UHF RADIO NOISE OF THE POLAR IONOSPHERE
V I Degtyarev, V V Klimenko, A A Chernov

02.09.05 GLOW FEATURES IN THE EQUATORIAL BOUNDARY REGION OF DIFFUSE PRECIPITATION OF ELECTRONS NEAR THE AURORAL ZONE
K I Gorely, Yu A Nadubovich, E A Ponomarev

02.09.09 TEMPORAL MEASUREMENTS OH AIRGLOW INTENSITY AND TEMPERATURE STRUCTURING
D J Baker, W R Pendleton Jr, P Espy

02.09.10 AURORAL IONOSPHERE DISTURBANCES DURING CREATION OF ARTIFICAL ION CLOUDS
S I Avdyushin, M B Belotserkovsky, V Yu Gaidukov, A M Evtushevsky, A I Livshits, V M Lipovetsky, Yu M Mikhailov, V V Mikhnevich, Yu A Romanovsky, M A Savelyev

02.09.15 COMETS AND THE ORIGIN OF THE ATMOSPHERES OF TERRESTRIAL PLANETS
M N Izakov

02.09.16 OPTICAL AND RADAR OBSERVATIONS OF A SUN-ALIGNED ARC AT SONDRESTROM
J W Meriwether Jr, P Shih, S B Mende, V B Wickwar, A Vallance Jones, R L Gattinger

IAGA DIVISION III BUSINESS MEETING

Prague, August 13. 1985, 5:00pm
Professor A Nishida in the Chair

Business Report

Restructuring of Division III

Professor Nishida referred to the proposal made to the IAGA Executive Committee by C T Russell for Division IV to inherit all of Division III activities from the magnetosphere outwards including the magnetosheath and bow shock but not the magnetotail. The aim of this suggestion was to reduce the overcrowding in Division III sessions. The President, Professor I Gough, requested the Division III and IV Chairmen to prepare discussion papers for submission to the Executive Committee for consideration at Prague. On behalf of Division III Professor Nishida consulted with the three Vice-Chairmen and the nine Reporter Reviewers and the discussion paper [pages XX-XX] was accepted by the Vice-Chairmen and the five Reporter Reviewers who replied. The paper proposed that the overcrowding problem be resolved by having parallel sessions.

A letter from the President, dated August 12, 1985, was tabled. It stated:
"....As the Executive Committee now has two essentially similar recommendations from these two Divisions (i.e. III and IV), in agreement with your statement "The Division III view of the Proposed Restructuring" dated July 25, the matter is resolved."

The President, who was present at the Executive Committtee, considered that Division IV should be responsible for the bow shock and the magnetosheath while Division III would consider magnetosheath properties relating to the magnetopause as well as the magnetopause and the magnetosphere. The final details will be negotiated by the Division III and IV Chairmen.

1. Professor Nishida proposed the adoption of the Agenda.

2. Working Group Leadership.

(a) The following change by WG III-2 was noted: Composition of Hot Magnetospheric Plasmas.
Chairman: H Balsiger
Vice-Chairman: E Shelley
The former Chairman/Vice-Chairman were R Johnson and H Balsiger respectively.

(b) Professor Nishida proposed to limit the WG Chairmanship to a term of four years.
The proposal was voted on and unanimously approved.

During discussion W Baumjohann stated that the continuation of WG's should be questioned from time to time, noting that they are not permanent groups.

3. Planning of Division III Sessions in 1987 at Vancouver.

This will be an IUGG Meeting and time for sessions will be limited. The meeting was informed that there would be no Division III related Interdisciplinary Symposia sponsored by IAGA at Vancouver.

Suggested URSI 1987 (Tel Aviv 25 August - 4 September) symposia topics of interest to Division III were tabled for information.

By way of background Professor Nishida informed the meeting that Division III was allocated 10 half-days at Canberra (1979), and 14 half-days at Hamburg (1983). He then tabled a list of Symposia proposed by the Division III membership for consideration. A suggested time allocation was presented by the Executive. This totalled 20 half-days.

The President advised the meeting that it should consider 16 half-days as a maximum number of sessions available everywhere taking into account parallel sessions.

Some considerable discussion followed and the following changes were decided on. (Session = one half-day).

(a) Symposium on Small Scale Disturbance of E and B and Particle acceleration in Auroral Regions proposed by Professor I Podgorny was combined with TAIL-AURORA Symposium.

(b) The VLF symposium was dropped because of overlap with a similar symposium to be held at URSI.

(c) The ULF WAVE/PARTICLE symposium was reduced to one session.

(d) The total sessions available for the ION COMPOSITION and PLASMASHEET symposia was reduced to three with the proposal to program them sequentially in order to anticipate possible overlap in the topic of heavy ions and provide flexibility in the allocation of time.

Convenors proposed by symposia sponsors and the Division Executive were accepted by the meeting. Other convenors were appointed later by the Division Chairman.

Dr Gokhberg proposed a symposium on Earth-ionosphere-magnetosphere coupling by accoustic and electromagnetic action. It was decided not to take this as one of the candidates of the Division III symposia and leave it to Chairmen of Divisions I, II and III to decide whether this symposium is to be organized outside the time allocations to the Divisions.

4. Resolutions

No resolutions were put forward by Division III but the Division will support the resolution that emphasizes the importance of the continued solar wind and IMF measurements proposed by Division II.

5. Other Business
Nothing was reported.

6. Adjournment
The meeting was adjourned at 6:40pm.

The Division III View of the Proposed Restructuring

Since the proposed restructuring involves Division III and IV, it would be useful to start by reviewing where the boundary lies at present. The IAGA By-laws do not specifically define the field of coverage of the Divisions beyond giving their names which consist of two words in the case of Division III, so that the only practical way of defining their respective fields of study is to look at the reporter topics of each Division. This survey shows that "bow shock" is already a Division IV topic; the topic IV-2 is titled "Waves, discontinuities and shocks in the interplanetary plasma", while the term "shock" appears nowhere in the Division III reporter topics. "Magnetosheath", on the other hand, is considered a Division III field as Topic III-2 is titled "Magnetosheath, Magnetospheric Boundary and Plasma Penetration." Hence the current dividing line between Divisions III and IV lies between the bow shock and the magnetosheath. (This should be an awfully difficult line to draw.) It would be useful also to note that "Solar Wind Interactions with Unmagnetized or Weakly Magnetized Bodies" is another Division IV topic.

It has indeed been acutely felt by the magnetosphere reserach community that our research cannot be adequately treated in a two-week meeting period if "no-parallel session" is a rule. Hence when we issued a questionnaire to ask opinions on the future conducts of Division III, we included a Point on the splitting of Division III. The question asked was:

7-1. It has widely and acutely been felt that the time available to Division III meetings is not sufficient for giving reasonable times to large number of high-quality papers submitted to Division III sessions. Some people interpret this to mean that the Division III has overgrown and is destined to split. Such a splitting of course sacrifices the integrity of the maagnetosphere community and should not be considered lightly. However, just to explore the general feeling, we would like to ask you if you think that such a splitting would become inevitable in the near future.

The response was amazingly unanimous:

Yes	16
Hope to be avoidable	161
Should be avoided	115

That is, 93% of the 292 respondents did not like to see the Division III split.

The material presented in the above two paragraphs will be the basis of our views of the restructuring. This does not mean that we are against any proposal that would touch the present field of coverage of Division III. However, having seen that maintaining the integrity of the magnetospheric research is the utmost priority of the great majority of the magnetospheric community, we believe that in order to be adopted a restructuring should have a sound scientific basis. In other words, only those topics whose place in the magnetospheric research is not necessarily vital may be moved to other Divisions or IDCs.

From this viewpoint, the magnetosheath could be moved to Division IV. In fact, the magnetosheath is just the downstream side of the bow shock, and it should be only natural for this topic to belong to a Division where the bow shock already belongs. We should be more than happy if such a shift can help attract more attention to the physics of the magnetosheath as it really deserves. Unfortunately, however, shifting magnetosheath studies to Division IV does not do much in the way of relieving the pressure on Division III, as the papers on the magnetosheath have occupied little space in the Division III programs.

Other than the magnetosheath, we can hardly come up with a topic which has a convincing scientific reason for being moved to Division IV. Magnetopause cannot be separated because the solar wind-magnetoshpere interaction is one of the most fundamental aspects of the magnetospheric research. Waves, as another example, cannot be separated because most of them grow and react back while interacting with the particle populations which constitute the magnetosphere. These topics are not suitable for IDC either as they are not related to (or, only very remotely related to) the fields of other Divisions.

Thus we should look elsewhere to let the high activitites of the magnetospheric research be adequately reflected in the IAGA meetings. The only possible solution seems to allow parallel sessions to Division III meetings. Practically, the essence of shifting the Division boundaries or creating new IDC's is to make it possible to program more than one session in parallel on the topics of magnetospheric physics. Although in the past it may have been an unwritten rule that any Division should avoid having parallel sessions, we do not believe that an exception is intolerable. In fact, at the Canberra Assembly in 1979 two sessions of Division III were

held in parallel for the period of two days. It is our view that we can best relieve the pressure of the Division III without hurting the integrity of the magnetspheric physics if the Executive Committee will allow us to organize some of our sessions in parallel.

Division III sessions

03.01 Response of the magnetosphere to the solar wind during quiet geomagnetic conditions

(Chairman: W P Olson)

INTRODUCTION
W P Olson, D A Hardy

03.01.06 PERSISTENT FEATURES IN THE INNER MAGNETOSPHERE IN ITS QUIESCENT STATE
D N Baker

03.01.03 THE EFFECT OF THE IMF ON THE GEOMAGNETIC FIELD AT GEOSTATIONARY ORBIT DURING INTERVALS OF NORTHWARD IMF
W J Hughes, S W H Cowley

13.13.73 CROSS-SECTIONAL AREA OF THE NEAR-EARTH MAGNETOTAIL
A T Y Lui

03.01.16 MAGNETOSPHERIC BOUNDARY LAYERS AND GEOMAGNETIC TAIL FOR NORTHWARD IMF
G Paschmann

03.01.15 IRREGULAR RECONNECTION AND TURBULENT PLASMA FLOWS IN THE MAGNETOTAIL DURING PERIODS OF NORTHWARD IMF: OBSERVATIONS FROM MAGSAT
P F Bythrow, W J Burke, T A Potemra, L J Zanetti, A T Y Lui

13.14.13 FILAMENTARY STRUCTURES IN THE MAGNETOTAIL
C Y Huang, L A Frank, J D Craven, W K Peterson, D J Williams, W Lennartsson, D G Mitchell, R C Elphic, C T Russell

03.01.14 POLAR CURRENT SYSTEMS, AURORA, PARTICLE AND ELECTRIC FIELD SIGNATURES
L J Zanetti, T A Potemra, P F Bythrow, C I Meng, R E Huffman, D A Hardy, F J Rich, W B Hanson

13.13.30 FIELD-ALIGNED CURRENTS UNDER NORTHWARD INTERPLANETARY MAGNETIC FIELD
M Sugiura, N C Maynard, R A Heelis

03.01.07 FIELD-ALIGNED CURRENTS DURING PERIODS OF NORTHWARD AND VANISHINGLY SMALL INTERPLANETARY MAGNETIC FIELD
Takesi Iijima

03.01.08 HOOK SHAPED POLAR CAP ARCS AMD AZIMUTHAL COMPONENT OF THE INTERPLANETARY MAGNETIC FIELD
M G Gusev, O A Troshichev

03.01.10 QUIET LEVEL OF GEOMAGNETIC AND IONOSPHERIC PARAMETERS DURING THE SOLAR ACTIVITY CYCLE
B Kuznetsov, N Ptitsyna

(Chairman: D A Hardy)

03.01.12 MAGNETIC FIELD VARIATIONS AT HIGH LATITUDES AT INTERVALS OF IMF BZ>0 AND CONNECTED WITH THEM ELECTRIC FIELDS, IONOSPHERIC AND FIELD-ALIGNED CURRENTS
Ju Z Demidova, D S Faermark, Y I Feldstein, A E Levitin, P V Sumaruk, A Prigantsova

13.14.14 THE NATURE OF THE AURORAL OVAL DURING RELATIVE MAGNETIC QUIESCENCE
L A Frank

13.13.70 AURORAL OVAL CONFIGURATION IN THE MAGNETOSPHERIC GROUND STATE
C-I Meng, K Makita

13.13.96 THE QUIET MAGNETOSPHERE - A THEORETICAL VIEW
R A Wolf, R W Spiro

03.01.05 A MAGNETOHYDRODYNAMIC SIMULATION OF THE MAGNETOSPHERE WHEN THE INTERPLANETARY MAGNETIC FIELD IS NORTHWARD
Raymond J Walker, Tatsuki Ogino

13.13.87 THE ENTRY OF SOLAR WIND PLASMA INTO A "MAGNETICALLY CLOSED" MAGNETOSPHERE
W P Olson, K A Pfitzer

03.01.02 THE NEUTRAL WIND "FLYWHEEL" AS A SOURCE OF QUIET-TIME, POLAR-CAP CURRENTS
L R Lyons, R L Walterscheid, T L Killeen

13.03.02 A SEMI-EMPIRICAL CONVECTION MODEL OF NORTHWARD IPMF
Min-yun Zi, Chang-Shou Sheng

13.13.12 REPRESENTING MAGNETOPAUSE FIELDS BY PARABOLIC HARMONICS
David P Stern

03.01.11 ELECTRIC FIELD IN THE PARABOLOID MODEL OF MAGNETOSPHERE
I I Alexeev, E S Belenkaya, V V Kalegaev

03.01.01 FORCE-FREE STREAMING OF HIGH-ENERGY PLASMA ALONG FIELD LINES IN COSMIC ATMOSPHERES AND THE ORIGIN OF AURORAE, POLAR CAPS, ETC
E Woyk

03.01.04 THE CATASTROPHE THEORY AS A NEW METHOD FOR MODELLING THE EVOLUTION OF THE STATE OF THE MAGNETOSPHERE
Tomas Zeithamer

03.01.13 ULF GEOMAGNETIC POWER AT CUSP LATITUDES IN RESPONSE TO UPSTREAM SOLAR WIND CONDITIONS
A Wolfe, E Kamen, L J Lanzerotti, C G Maclennan, J F Bamber, D Venkatesan

03.01.09 A COMPARISON OF THE SATELLITE MEASUREMENTS OF ELECTRIC AND MAGNETIC FIELDS AND PARTICLE FLUXES WITH THE GROUND GEOPHYSICAL DATA
N V Isaev, A G Yakhnin

03.01.17 IMPULSIVE PENETRATION OF SOLAR WIND PLASMOIDS IN THE MAGNETOSPHERE FOR NORTHWARD INTERPLANETARY MAGNETIC FIELD
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(Chairman: R J Hynds)

03.06.01 DISTANT TAIL MAGNETIC FIELD RESULTS: ISEE-3
B T Tsurutani, D E Jones, G L Siscoe, E J Smith

03.06.02 STRUCTURAL AND DYNAMICAL ASPECTS OF THE DISTANT MAGNETOTAIL DETERMINED FROM ISEE 3 PLASMA MEASUREMENTS
E W Hones

(Chairman: M Scholer)

03.06.03 FLUX CONTENT AND SHAPE OF THE DISTANT MAGNETOTAIL
D G Sibeck, G L Siscoe, E J Smith

03.06.04 A SIMPLE MHD MODEL OF THE EARTH'S DEEP MAGNETOTAIL BOUNDARY LAYER
S Grzedzielski, W Macek, J Ziemkiewicz

03.06.05 THE NATURE OF THE DISTANT GEOMAGNETIC TAIL MAGNETOPAUSE AND BOUNDARY LAYER
J T Gosling, M F Thomsen, D W Swift, L C Lee

03.06.06 BIDIRECTIONAL ANISOTROPIES OF PLASMA ELECTRONS IN THE DISTANT MAGNETOTAIL: ISEE-3
D N Baker, J T Gosling, S J Bame, W C Feldman, R D Zwickl

03.06.07 ISEE-3 PLASMA SHEET OBSERVATIONS: DISTANT NEUTRAL LINE POSITION AND RESPONSE TO SUBSTORM ACTIVITY
J A Slavin, E J Smith, P W Daly, T R Sanderson, K-P Wenzel, D G Sibeck, H W Kroehl

03.06.08 DORMANT NEUTRAL LINE WITHIN THE DISTANT PLASMA SHEET: A NEW SUBSTORM FEATURE
A Nishida, M Scholer, T Terasawa, S J Bame, G Gleockler, E J Smith, R Zwickl

03.06.09 PECULIARITY OF ION KINETICS NEAR THE DEEP TAIL MAGNETIC FIELD REVERSAL AND ITS INFLUENCE ON PLASMA STABILITY
J Buechner, L M Zeleny, C-U Wagner

(Chairman: E J Smith)

03.06.10 DYNAMICS OF THE DEEP MAGNETOTAIL AS INFERRED FROM ENERGETIC PARTICLE MEASUREMENT
M Scholer

03.06.11 A SURVEY OF ISEE-3 ENERGETIC ION RESULTS (EPAS) IN THE DEEP GEOMAGNETIC TAIL
P W Daly

03.06.12 PLASMOID-ASSOCIATED ENERGETIC ION BURSTS IN THE DEEP GEOMAGNETIC TAIL
I G Richardson, S W H Cowley

03.06.13 LEFT-HAND POLARIZED MHD WAVES IN THE DISTANT TAIL PLASMASHEET BOUNDARY LAYER
B T Tsurutani, E J Smith, W H Butler, R M Thorne, M A Coplan, K W Ogilvie, M Scholer

03.06.14 COMPARISON OF ENERGETIC PARTICLE OBSERVATIONS AT GEOSTATIONARY ORBIT (GEOS-2) AND IN THE DEEP GEOMAGNETIC TAIL (ISEE-3) DURING GEOMAGNETIC SUBSTORMS
P W Daly, A Korth, G Kremser, T R Sanderson, K-P Wenzel

03.07 Dayside cusp, magnetopause and magnetospheric boundary layer. [Jointly with Division II]
(Chairman: G Paschmann)

03.07.01 MAGNETOPAUSE RECONNECTION ON LARGE AND SMALL SPATIAL SCALES
G Haerendel

03.07.02 BOUNDARY LAYER STRUCTURE AS OBSERVED BY PROGNOZ-7,8 SATELLITES
E M Dubinin, A S Volokitin, A V Zacharov, R Lundin, N F Pissarenko

03.07.03 ENERGY CONVERSION IN THE DAYSIDE BOUNDARY LAYER - OBSERVATIONS AND IMPLICATIONS
Rickard Lundin

03.07.04 ENERGETIC PARTICLES AT THE MAGNETOPAUSE, BOW SHOCK AND MAGNETOSHEATH OF EARTH: OBSERVATIONS ON PROGNOZ SATELLITES
A E Antonova, O R Grigorian, V P Stolpovsky

03.07.05 ISEE-1 ENERGETIC PARTICLE OBSERVATIONS IN THE LOW LATITUDE BOUNDARY LAYER
D J Williams, D G Mitchell, T E Eastman, L A Frank, F Kutchko

03.07.06 ACCELERATED PLASMA FLOWS AT THE TAIL MAGNETOPAUSE
J T Gosling, M F Thomsen, S J Bame, C T Russell

03.07.30 EVIDENCE FOR A KELVIN HELMHOLTZ INSTABILITY AT THE LOW-LATITUDE BOUNDARY LAYER: A HILAT CASE STUDY
P F Bythrow, M A Doyle, C I Meng, R E Huffman, D A Hardy, F J Rich, W B Hanson, T A Potemra, L J Zanetti

03.07.08 MHD-MODEL OF THE MAGENTOSPHERE BOUNDARY LAYER
G F Krymsky, I Ya Plotnikov

(Chairman: J C Foster)

03.07.09 FLUX TRANSFER EVENTS AT HIGH AND LOW ALTITUDES
R P Rijnbeek

03.07.10 EMPIRICAL MODELING OF FLUX TRANSFER EVENTS: ISEE-1 AND -2 CONSTRAINTS ON MAGNETIC STRUCTURE
R C Elphic

03.07.11 TRAPPED ELECTRON DISTRIBUTIONS ON OPEN MAGNETIC FIELD LINES, II; OBSERVATIONS OF THE INNER SEPARATRIX
P W Daly

03.07.12 ISEE 1 AND 2 FLUX TRANSFER EVENTS: 1. MAGNETIC SIGNATURES SEEN SIMULTANEOUSLY ON OPPOSITE SIDES OF THE MAGNETOPAUSE
C J Farrugia, D J Southwood

03.07.13 THE SIMULATION OF THE RECONNECTION IN THE DAYSIDE MAGNETOPAUSE CURRENT LAYER
I M Podgorny, I A Semenov

03.07.14 STEADY-STATE RECONNECTION OF SKEWED FIELDS AND SHEAR FLOW ALONG THE RECONNECTION LINE
M F Heyn, H K Biernat, V S Semenov, I V Kubyshkin

03.07 Dayside cusp, magnetopause and magnetospheric boundary layer. [Jointly with Division II]
(Chairman: I M Podgorny)

03.07.16 THE ROLE OF VISCOUS INTERACTION FOR MAGNETOSPHERIC CONVECTION
F S Mozer

03.07.17 DEPENDENCE OF THE SITE OF ACCELERATED MAGNETOPAUSE BOUNDARY LAYER FLOW ON ALFVEN MACH NUMBER
N U Crooker

03.07.18 MAGNETOPAUSE OBSERVATIONS WITH AMPTE/IRM
G Paschmann, I Papamastorakis, W Baumjohann, N Sckopke, C W Carlson, H Luehr

13.13.86 A QUANTITATIVE STUDY OF PARTICLES AND CURRENTS IN THE MAGNETOSPHERIC CUSP REGION
W P Olson, K A Pfitzer

03.07.20 MAGNETOSPAUSE BOUNDARY LAYER ELECTRONS OBSERVED BY AMPTE-UKS
C P Chaloner, D A Bryant, D S Hall, R P Rijnbeek, D J Southwood

03.07.21 AMPTE-UKS PARTICLE CORRELATOR MEASUREMENTS DURING ION RELEASES AND NEAR THE MAGNETOSPHERIC BOUNDARIES
M P Gough, P J Christiansen, A J Norris

(Chairman: D J Williams)

03.07.22 TRANSPORT OF PLASMA ACROSS THE MAGNETOPAUSE
Walter J Heikkila

03.07.23 IONIC COMPOSITION IN FLUX TRANSFER EVENTS AND INSIDE THE MAGNETOPAUSE
B Klecker, E Moebius, D Hovestadt, M Scholer, G Gloeckler, F M Ipavich

03.07.24 OBSERVATION OF ENERGETIC MOLECULAR IONS IN THE OUTER MAGNETOSPHERE
D Hovestadt, B Klecker, E Moebius, M Scholer, G Gloeckler, F M Ipavich

03.07.25 ION COMPOSITION IN THE LOW LATITUDE BOUNDARY LAYER MEASURED FROM THE AMPTE/CCE SATELLITE
D M Klumpar, E G Shelley

03.07.26 SPATIAL DISTRIBUTIONS OF MAGNETIC FIELD FLUCTUATIONS IN THE DAYSIDE MAGNETOSHEATH
J G Luhmann, R C Elphic, C T Russell

03.07.27 A TEMPORALLY-VARYING GAS DYNAMIC MAGNETOSHEATH MODEL
J G Luhmann, R J Warners, C T Russell, J R Spreiter, S S Stahara FRIDAY 9 AUGUST 1985

(Chairman: G Haerendel)

03.07.28 IONOSPHERIC SIGNATURE OF THE LOW-LATITUDE BOUNDARY LAYER
W J Burke

03.07.29 SOLAR WIND ENERGY TRANSFER ACROSS THE MAGNETOSPHERIC BOUNDARY LAYER
V M Mishin, V V Shelomentsev, T I Saifudinova, D Sh Shirapov, S B Lunyushkin

03.07.31 THE FIELD-ALIGNED CURRENT DISTRIBUTION IN THE POLAR CUSP REGION IN DEPENDENCE ON THE INTERPLANETARY MAGNETIC FIELD ORIENTATION: A MODEL
M I Pudovkin, S A Zaitseva, A V Usmanov

03.07.32 OBSERVED AND MODELED EFFECTS OF THE IMF BY AND BZ COMPONENTS ON IONOSPHERIC CONVECTION IN THE VICINITY OF THE DAYSIDE POLAR CLEFT
C R Clauer, P M Banks

03.07.33 CURRENT REGIONS 1 AND 2 AND CUSP CURRENTS AS SEEN BY INTER-COSMOS-BULGARIA-1300
A Bochev, I Arshinkov, P Nenovski

03.07.34 CONJUGACY OF THE POLAR CUSPS
M Candidi, C-I Meng

(Chairman: G F Krimsky)

03.07.35 THE CUSP AT LOW INVARIANT LATITUDES
S M Broom, M Pinnock, A S Rodger

03.07.36 DISTRIBUTION OF RADIO AURORAE IN THE SOUTHERN POLAR CUSP REGION AND THE INTERPLANETARY MAGNETIC FIELD
N N Voloshinov, O A Troshichev

03.07.37 IONOSPHERIC CURRENTS AND PRECIPITATION REGIONS NEAR THE CUSP
S Vennerstrom, E Friis-Christensen

03.07.39 IONOSPHERIC CHARACTERISTICS AT THE AURORAL OVAL/POLAR CAP BOUNDARY
J C Foster, J M Holt

03.07.40 LOW-ALTITUDE SIGNATURES OF MERGING DURING PERIODS OF NORTHWARD DIRECTED INTERPLANETARY MAGNETIC FIELD
J M Bosqued, J A Sauvaud, Yu I Galperin

03.07.41 COEXISTING PAIRS OF DPY-CURRENTS AND IMF-VARIATIONS
E Friis-Christensen, S Vennerstrom

03.08 General contributions to Division III.
(Chairman: M G Kivelson)

03.08.01 THE AMPTE RELEASES (INTRODUCTION)
D J Southwood

03.08.02 AMPTE'S COMETARY RELEASE: LATEST RESULTS OBTAINED FROM THE IRM AND UKS MAGNETIC FIELD MEASUREMENTS
D J Southwood, M W Dunlop, W A C Mier-Jedrzejowicz, R P Rijnbeek, M Six, H Luehr, M Kloecker

03.08.03 AMPTE'S LITHIUM RELEASES IN THE SOLAR WIND: IN SITU MAGNETOMETER MEASUREMENTS FROM THE IRM AND UKS
D J Southwood, M W Dunlop, W A C Mier-Jedrzejowicz, R P Rijnbeek, M Six, H Luehr, N Kloecker

03.08.04 INTERPRETATION AND ANALYSIS OF THE ELECTROSTATIC NOISE ASSOCIATED WITH THE AMPTE SOLAR WIND RELEASES
D A Gurnett, T Z Ma, R R Anderson, O H Bauer, G Haerendel, B Haeusler, G Paschmann, R A Treumann, H C Koons, R Holzworth, H Luehr

03.08.05 PLASMA WAVE ACTIVITY DURING THE AMPTE-IRM "ARTIFICIAL COMET" BARIUM RELEASE
O H Bauer, G Haerendel, B Haeusler, R A Treumann, R R Anderson, D A Gurnett, R H Holzworth, H C Koons

03.08.06 3D-PLASMA OBSERVATIONS ON AMPTE/IRM FOR THE LITHIUM AND BARIUM RELEASES IN THE SOLAR WIND
G Paschmann, W Baumjohann, N Sckopke, G Haerendel, C W Carlson, D W Curtis

03.08.07 ELECTRON ENERGIZATION ASSOCIATED WITH ARTIFICIALLY-PRODUCED DIAMAGNETIC CAVITIES IN THE SOLAR WIND
D S Hall, D A Bryant, C P Chaloner, R A Bingham, D R Lepine

03.08.09 DETECTION OF ENERGETIC (>100 KEV) MOLECULAR IONS IN THE EARTH'S MAGNETOSPHERE
G Gloeckler, D C Hamilton, F M Ipavich, G Kremser, W Studemann, B Wilken

03.08.10 FIRST COMPOSITION MEASUREMENTS OF THE BULK OF THE STORM TIME RING CURRENT (1 TO 315 KEV/E)
G Gloeckler, D C Hamilton, F M Ipavich, W Studemann, B Wilken, G Kremser, D Hovestadt

03.08.11 ENERGETIC N+ IONS IN THE MAGNETOSPHERE
F M Ipavich, D C Hamilton, G Gloeckler, G Kremser, W Studemann, B Wilken

03.08.12 DOWNTAIL PROJECTION OF AURORAL OVAL BY O+ IONS
W Lennartsson, R D Sharp

03.08.26 MODEL FOR AURORAL TURBULENCE AND PLASMA HEATING
M Roy, G S Lakhina

(Chairman: H J Singer)

03.08.14 QUASI-PARALLEL PROPAGATION OF ELECTROSTATIC AND ELECTROMAGNETIC WAVES NEAR THE ELECTRON PLASMA FREQUENCY
R B Horne

03.08.15 PARALLEL ELECTRIC FIELD ON THE AURORAL FIELD LINES
A P Kropotkin, S A Martyanov

03.08.16 MHD STABILITY OF A NOISY MAGNETIC NEUTRAL SHEET
P R Smith, K I Hopcraft

03.08.17 WAVE PHENOMENA ASSOCIATED WITH THE CHARACTERISTIC MAGNETOTAIL PLASMA REGIONS: "PROGNOZ 8" SATELLITE DATA
S I Klimov, M A Balikhin, J Bleschy, J Buchner, B Domanssky, K Kossachy, P Oberc, S A Romanov, S P Savin, A A Skalsky, A Yu Sokolov, P Triska, J Vojta, L M Zeleny

03.08.18 OBSERVATIONS OF THE COLD PLASMA IN THE TAIL LOBE
R Jimenez, O Vaisberg, S Romanov, A Omeltchenko, R Isaeva

03.08.19 AN ISEE-1 AND -2 SURVEY OF PLASMASHEET BOUNDARY LAYER FIELD-ALIGNED CURRENTS
R C Elphic, P A Mutch, C T Russell

03.08.20 CURRENT DENSITY DISTRIBUTIONS IN THE NEAR EARTH CROSS-TAIL CURRENT SHEET
D J McComas, C T Russell, R C Elphic

03.08.21 ISEE-1 AND -2 OBSERVATIONS OF BIRKELAND CURRENTS IN THE EARTH'S INNER MAGNETOSPHERE
T J Kelly, C T Russell, R J Walker

03.08.22 EVIDENCE FOR A SOURCE OF ENERGETIC PARTICLES INSIDE THE PLASMA SHEET
G P Pavlos, D V Sarafopoulos, E T Sarris

03.08.23 ON BOUNDARY LAYER HEAVY IONS AND THE ORIGIN OF THE PLASMA SHEET
Rickard Lundin

03.08.24 BURST STRUCTURE OF AURORAL BREAK-UP IN X-RAYS AND IRREGULAR MAGNETIC PULSATIONS
A A Khruschinsky, K-H Glassmeier, J Kangas, L L Lazutin, Ya A Sakharov

03.08.46 ON THE APPLICATION OF THE GEOMAGNETIC FIELD POGO (8/69) MODEL FOR THE MAPPING OF THE RADIATION BELT PROTON FLUXES
S I Avdjushin, I G Kostuchenko, A B Malyshev, P M Svidsky
IONOSPHERIC ORIGIN OF PiC
T Oguti (et al.)

(Chairman: R P Rijnbeek)

03.08.31 SATURN: A UNIQUE MAGNETOSPHERE/IONOSPHERE/RING INTERACTION
J E P Connerney

03.08.32 IMF CONTROL AND CONVECTION IN THE JOVIAN MAGNETOSPHERE
A Nishida, K Maezawa

03.08.33 THE ROLE OF ION CYCLOTRON WAVES ON ION PRECIPITATION IN THE VICINITY OF THE JOVIAN IO TORUS
R Gendrin

03.08.34 THE DM-VARIATION - A NEW COMPONENT OF THE GEOMAGNETIC VRAIATION FIELD IN MIDDLE LATITUTDES
A Grafe

03.08.35 PROGNOSTICALLY SIGNIFICANT PROPERTIES OF THE LONG-TERM BEHAVIOUR OF GEOMAGNETIC ACTIVITY AND ITS RELATION TO SOLAR ACTIVITY
Jaroslav Halenka

03.08.36 NON RESONANT ACCELERATION OF COLD HE+ IONS BY ION CYCLOTRON WAVES PROPAGATING IN A MULTI-COMPONENT PLASMA
R Gendrin, J Berchem

03.08.37 NUMERICAL SIMULATION OF ION CYCLOTRON WAVE GENERATION IN A MULTI-COMPONENT PLASMA
Y Omura, M Ashour-Abdalla, R Gendrin, K Quest

03.08.38 PRECIPITATION OF CHARGED PARTICLES FROM OUTER RADIATION BELT DURING MAGNETIC SUBSTORMS
Yu V Gotselyuk, M S Kazaryan, S N Kuznetsov, K Kudela, I Kimak

03.08.39 PARTICLE AND FIELD OBSERVATIONS DURING WESTWARD TRAVELLING SURGES
P Tanskanen, J Kangas, J Bjordal, L P Block, K Bronstad, I B Iversen, A Korth, G Kremser, K M Madsen, K Torkar, S Ullaland

03.08.40 VLF-5 AND 9 KHZ EMISSIONS OBSERVED AT 40-DEG GEOMAGNETIC LATITUDE
Tz Ralchovsky

03.08.41 TRAVEL TIME RESIDUALS AND ERROR SOURCES IN WHISTLER INTERPRETATION
Gy Tarcsai, H J Strangeways, M J Rycroft

03.08.42 AVERAGE ELECTRON DENSITY PROFILES IN THE PLASMASPHERE BETWEEN L=1.4 AND 3.2 DEDUCED FROM WHISTLERS
Gy Tarcsai, L Hegymegi, P Szemeredy

03.08.43 A NEW TYPE OF BANDED DISCRETE VLF EMISSION INSIDE THE PLASMASPHERE
U S Inan, W Poulsen, J P Katsufrakis, R A Helliwell

03.08.44 COMPUTATION OF WHISTLER WAVE NORMAL DIRECTIONS BY A MATCHED FILTER TECHNIQUE
J Lichtenberger, D Hamar, L Cserepes

03.08.45 AN AUTOMATIC VLF RECORDING STATION IN TIHANY OBSERVATORY
L Hegymegi, L Drimusz, T Hetenyi, A Kormendi

03.09 Reporter Reviews

(Chairman: A Nishida)

MAGNETOSPHERE-IONOSPHERE INTERACTIONS
Y Kamide

MAGNETOSHEATH, MAGNETOSPHERIC BOUNDARY AND PLASMA PENETRATION
S W H Cowley

DISTRIBUTION AND PROPERTIES OF MAGNETOSPHERIC PLASMAS
N R A Lundin

ENERGETIC PARTICLE POPULATIONS INCLUDING COSMIC RAY ENTRY
L R Lyons

ULF WAVES
A D M Walker

PLASMA WAVES AND WAVE PARTICLE INTERACTIONS
A Roux

MAGNETIC STORMS AND SUBSTORMS, INCLUDING AURORA-MAGNETOSPHERE RELATIONS
W Baumjohann

MAGNETOSPHERES OF OTHER PLANETS
G L Siscoe

ACTIVE SPACE EXPERIMENTS, LABORATORY EXPERIMENTS AND COMPUTER SIMULATIONS
D Southwood

Papers withdrawn from Division 3 sessions:

NUMERICAL SIMULATIONS AND ULF PLASMA WAVES
T Sato

03.04.05 RESULTS OF IN-SITU STUDIES OF THE PLASMASPHERE AND OF PECULIARITIES OF THE PLASMAPAUSE
K Gringauz

03.04.03 FINE CHARACTERISTICS OF VLF SPECTRA AND ENERGETIC PARTICLE DISTRIBUTION IN PLASMASPHERE
P A Bespalov

13.14.09 WHISTLER DUCT CROSS-SECTIONS IMPLIED BY MULTI-BALLOON MEASUREMENTS OF VLF HISS
R L Dowden, R H Holzworth

03.04.10 THE DETERMINATION OF EQUATORWARD BOUNDARY OF THE INVASION OF STRONG ELECTRIC FIELDS INTO THE PLASMASPHERE BY THE GROUND-BASED VERTICAL SOUNDINGS OF THE IONOSPHERE
A S Besprozvannaya, T I Shchuka

03.04.07 FINE STRUCTURE OF LOW FREQUENCY AMPLITUDES OF GEOMAGNETIC FIELD AND PARTICLE'S FLUX DENSITY DURING STRONG MAGNETIC STORMS
I B Volkov, G A Gluchov, Yu P Kratenko, V I Larkina, Yu V Mineev, I N Senchuro

13.13.75 EMPIRICAL MODELS OF CONVECTIVE ELECTRIC FIELDS
J P Heppner, N C Maynard

SAINT-SANTIN OBSERVATIONS OF IONOSPHERIC SUBSTORMS
C Mazaudier

03.05.15 MAGNETOSPHERE SUBSTORM MANIFESTATION IN DIFFUSE AURORA POLEWARD THE AURORAL BULGE
I B Ievenko, V P Samsonov

03.07.07 THE PENETRATION OF THE INTERPLANETARY MAGNETIC FIELD (IMF) INTO THE MAGNETOSPHERIC TAIL
K A Pfitzer, W P Olson

03.07.15 RECONNECTION OF CROSSED MAGNETIC FIELDS
V S Semenov

03.07.19 THE LOW LATITUDE BOUNDARY LAYER: AMPTE-UKS OBSERVATIONS
M F Smith, D J Rodgers, A J Coates, A D Johnstone, D J Southwood

03.07.38 HEAT FLOW IN THE TOPSIDE IONOSPHERE IN THE CUSP REGION
D B Muldrew

03.08.25 ON THE NATURE OF PULSATING AURORAL PATCHES
S A Chernouss

03.08.27 ON VARIATIONS OF DISCRETE AURORAL FORM INTENSITY DURING THE BREAKUP
V A Tagirov, A B Pashin, A G Yahnin, O M Raspopov, S A Chernouss

03.08.28 THE SPATIAL LOCATION OF BREAKUP INSTABILITY IN AURORAL MAGNETOSPHERE
L L Lazutin

03.08.29 CHANGE OF THE MAGNETOSPHERIC CONFIGURATION AND GROWTH PHASE ENERGETIC ELECTRON PRECIPITATION
L L Lazutin, A O Melnikov, M V Malkov, J-P Treilhou

03.08.30 AURORAL VLF-HISS AT POLAR CAP
N G Kleimenova, Yu V Golikov, J M Holtet

03.08.13 THE GEOMAGNETIC MASS SPECTROMETER
J H Waite Jr, M Lockwood, T E Moore, M O Chandler, C R Chappell

DIVISION IV
BUSINESS MEETING

Time: Friday, August 10th, 6.30 - 8.00pm
Chairman: F M Neubauer

1. Activities of Division IV 1983-85

In addition to organizing Division IV sessions for the Prague IAGA meeting a "Workshop on the Solar Wind" in April 1984 in Moscow organised by Professor Gringauz was co-sponsored by IAGA Division IV.

2. Extension of Purview of Division IV

Following an initiative of Dr C T Russell (USA) with the aim to release somewhat the burden on Division III the question was discussed whether Division IV should be extended by including the Earth's bow shock or even the magnetosheath in Division IV. The discussion was taking place by correspondence before the meeting and finally at the business meeting.

Division IV adopted the following proposal: The bow shock should be covered by Division IV including the downstream part of the bow shock in the magnetosheath. Magnetosheath studies of the flow of magnetoplasms around the magnetopause, dynamic phenomena in the boundary layer of the magnetopause like "flux-transfer events", other reconnection phenomena etc., should remain in Division III. Co-convenorship by Division III should be considered from case to case.

Chairman's afterthought: Although at the business meeting only the Earth's bow shock was considered, all planetary bow shocks should be included.

3 Representation of Division IV in Working Group in quantitative magnetospheric models of Division III

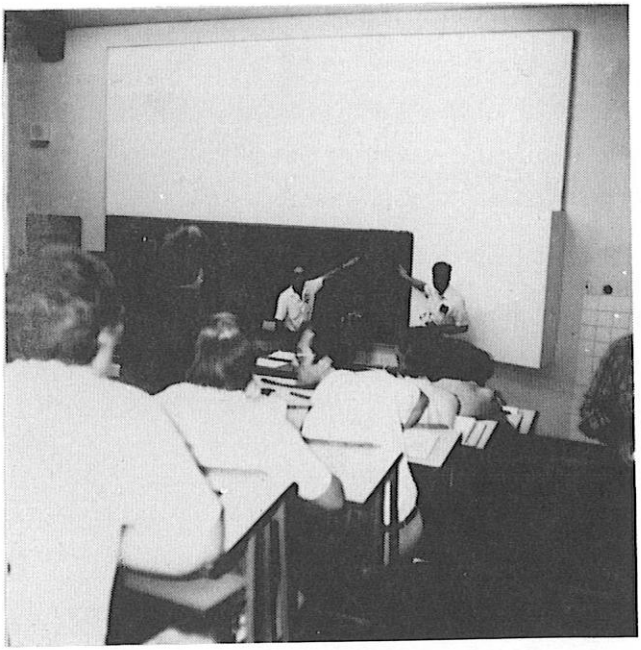
Dr Olson, Chairman of the Working Group mentioned above, has asked Division IV to cooperate in the Working Group by naming a representative. It was felt in the Division IV business meeting that although the Working Group is not of primary interest to Division IV, a representative should be named.

4. Inter-Division Commission on "Mathematical and Numerical Geophysics" Letter by J Cain at Prague meeting]

No strong need for such a Commission was seen in Division IV. However, if a strong need was seen by the other

divisions, Division IV would cooperate in its fields of prime interest namely, fluid-dynamic simulation studies and plasma kinetic simulation studies. Co-convenorship will be asked from Division IV.

5. Any Other Business.
There being no other business, the meeting was closed.



Division IV sessions

04.01 General contributions to Division IV on solar wind and interplanetary magnetic field
(Chairman: F M Neubauer)

04.01.01 MAGNETIC HOLES AND CURRENT SHEETS IN THE SOLAR WIND
S J Schwartz, D S Hall, A D Johnstone, D J Southwood, V Formisano

04.01.02 NUMERICAL SIMULATION OF THE EFFECTS OF COULOMB COLLISIONS ON THE RADIAL EVOLUTION OF SOLAR WIND ION DISTRIBUTION FUNCTIONS
S Livi, E Marsch

04.01.03 EFFECTIVE COULOMB SELF-COLLISION RATES FOR NON-THERMAL PARTICLE DISTRIBUTIONS
E Marsch, S Livi

04.01.04 EXACT COLLISIONAL EVOLUTION OF A DOUBLE-BEAM AND A BI-MAXWELLIAN DISTRIBUTION FUNCTION
S Livi, E Marsch

04.01.05 INTERPLANETARY SCINTILLATIONS AND THE SOLAR WIND TRANSONIC REGION
N A Lotova, D F Blums

04.01.06 FIRST RESULTS OF THE MAGNETIC FIELD EXPERIMENT ABOARD THE VEGA SPACEPROBES
W Riedler, K Schwingenschuh, G Schelch, Ye G Yeroshenko, V A Stjazhkin

04.01.08 SOLAR CYCLE VARIATION OF INTERPLANETARY FIELD ENHANCEMENTS
C T Russell, W Weibel, M R Arghavani

04.01.09 THREE SPACECRAFT OBSERVATIONS OF AN INTERPLANETARY FIELD ENHANCEMENT
C T Russell, J L Phillips, M R Arghavani, K Schwingenschuh

04.01.10 NEAR TAIL RECONNECTION AS THE CAUSE OF COMETARY TAIL DISCONNECTIONS
C T Russell, J L Phillips, M A Saunders, J A Fedder

04.01.11 ALMOST ALL PLANETS SHOULD POSSESS VAN ALLEN RADIATION BELTS, AND AURORAE SHOULD OCCUR AFTER EACH STRONGER IMPACT OF SOLAR WIND
E Woyk

04.01.12 POSSIBLE EVIDENCE OF MASS LOADING UPSTREAM FROM THE VENUS BOW SHOCK
F L Scarf, E W Greenstadt, S L Moses, D S Intriligator, C T Russell

04.01.13 SOLAR WIND-VENUS INTERACTION INDUCED WAVE REGION PLASMA AND FIELD PERTURBATIONS
R N Singh

04.01.14 TRANSPORT OF MOMENTUM FLUX ACROSS THE VENUS IONOPAUSE
H Perez de Tejada

04.01.15 SOME PROBLEMS OF THE SOLAR WIND INTERACTION WITH VENUS
T K Breus, A M Krymskii

04.01.16 INTERACTION OF MASS-LOADED SOLAR WIND FLOW WITH BLUNT BODY
T K Breus, A M Krymskii, V Ya Mitnitskii

04.01.17 COMET-LIKE SOLAR WIND INTERACTION PROCESSES AT VENUS
L H Brace, W Kasprzak, C T Russell, F L Scarf

04.01.18 A PVO STUDY OF THE FIELD LINE DRAPING AND MASS LOADING AT VENUS: OBSERVATIONS RELEVANT TO COMETARY RAYS AND ION TAILS
J A Slavin, D S Intriligator, E J Smith

04.01.19 DOPPLER IMAGING OF THE AMPTE "ARIFICIAL COMET" RELEASE
David Rees, Gerhard Haerendel, Duncan Bryant

04.02 Reporter review session and business meeting of Division IV.
(Chairman: F M Neubauer)

04.02.01 REVIEW OF RECENT STUDIES OF LARGE-SCALE SOLAR WIND FEATURES
A J Lazarus

04.02.02 TURBULENCE, WAVES AND DISCONTINUITIES IN THE SOLAR WIND - A REVIEW
Melvyn L Goldstein

04.02.03 SOLAR WIND INTERACTION WITH WEAKLY MAGNETIZED BODIES
T E Cravens, T I Gombosi

04.02.04 PLASMA COMPOSITION AND NEUTRAL GASES IN THE INTERPLANETARY MEDIUM
H J Fahr

04.03 Large scale structure and dynamics of the solar wind
(Chairman: E J Smith)

04.03.01 THE EVOLUTION OF COROTATING INTERACTION REGIONS BETWEEN 0.29 AND 1 AU
R Schwenn, H Rosenbauer, E Marsch, K H Muhlhauser, F M Neubauer

04.03.02 THE SOLAR WIND TEMPERATURE-VELOCITY RELATIONSHIP
Ramon E Lopez, John W Freeman

04.03.03 VENERA 13/14, PVO AND ISEE-3 OBSERVATIONS OF INTERPLANETARY MAGNETIC FIELD DISTURBANCES
K Schwingenschuh, W Riedler, G Schelch, Ye G Yeroshenko, E I Morozova, N F Pissarenko, C T Russell, E J Smith

04.03.04 HIGH SPEED STREAM STRUCTURE IN THE SOLAR WIND AT THE DECLINING PHASE OF THE 21ST SOLAR CYCLE: PROGNOZ-9
K Gringauz, V Bezrukikh, M Verigin, G Kotova, Ye Yeroshenko, V Styazhkin, W Riedler, K Schwingenschuh

13.04.01 INFLUENCE OF THE INTERSTELLAR MAGNETIC FIELD ON THE SHAPE OF THE HELIOSPHERE
H J Fahr, S Grzedzielski, R Ratkiewicz-Landowska

13.04.02 A TWO-FLUID EQUATION SYSTEM FOR THE SOLAR WIND PLASMA
S Duhau

(Chairman: O A Vaisberg)

04.03.05 MULTISATELLITE OBSERVATIONS OF THE SOLAR WIND RECURRENT HIGH-SPEED STREAMS DURING SOLAR ACTIVITY DECLINING PHASE IN 1973-1974
T K Breus, S V Ivanova, N G Ptitzina, M I Verigin

04.03.06 IMF OBSERVATION WITH THE JAPANESE HALLEY SPACECRAFT "SAKIGAKE" AND THE SOLAR GIANT REGIONS
T Saito, K Yumoto, K Hirao, I Aoyama, M Seto

04.03.07 THE HELIOSPHERIC CURRENT SHEET: STRUCTURE AND SOLAR CYCLE CHANGES
E J Smith, J A Slavin, B T Thomas

04.03.08 A SIMULATION STUDY OF MAJOR HELIOSPHERE DISTURBANCES BY A KINEMATIC METHOD
Syun-Ichi Akasofu, Craig D Fry

04.03.09 AN ANALYSIS OF SOLAR WIND FLUCTUATIONS BETWEEN 1 AND 10 AU
A J Lazarus

04.03.10 ENHANCED LOW ENERGY (1 MEV) ION FLUXES IN THE OUTER HELIOSPHERE
R E Gold, L J Lanzerotti, C G Maclennan

04.03.12 EVOLUTION AND INTERACTION OF LARGE INTERPLANETARY STREAMS
Y C Whang, L F Burlaga

04.03.13 SOLAR WIND HEATING BY INTERSTELLAR HYDROGEN - MODELLING THE VOYAGER OBSERVATIONS
P A Isenberg, P-P Chih

04.04 Waves, discontinuities and turbulence in the solar wind.

(Chairman: A K Richter)

04.04.01 THE PLASMA PROPERTIES OF SMALL-SCALE MAGNETIC HOLES IN THE SOLAR WIND
M F Thomsen, J T Gosling, S J Bame, C T Russell

04.04.02 HELIOS OBSERVATIONS OF MAGNETIC FLUCTUATIONS AND PROTON HEATING
Ramon E Lopez, John W Freeman

04.04.03 EXCITATION OF OBLIQUE WHISTLERS BY SOLAR WIND HEATFLUX
G S Lakhina

04.04.04 EXCITATION OF COMPRESSIONAL WAVES IN THE EARTH'S FORESHOCK AND THE FORMATION OF SHOCKLETS
T Hada, T Terasawa, C F Kennel

04.04.05 LOW FREQUENCY WAVES IN THE SOLAR WIND ASSOCIATED WITH IONS FROM SATURN
K W Behannon, M L Goldstein, R F Lepping, H K Wong, B H Mauk, S M Krimigis

04.04.06 OBSERVATION OF MAGNETIC FIELD LINE RECONNECTION IN THE SOLAR WIND
E Amata, R Bruno, V Formisano, C T Russell

04.04.07 CORONAL ALFVEN VELOCITY MEASUREMENTS INSIDE TEN SOLAR RADII
M K Bird, H Volland, A I Efimov, C T Stelzried, B L Seidel

04.04.09 BEAM DRIVEN ELECTRON ACOUSTIC WAVES UPSTEAM OF THE EARTH'S BOW SHOCK
E Marsch

13.04.03 HYDROMAGNETIC WAVES AND ELECTRON HEAT INSTABILITIES IN THE SOLAR WIND PLASMA
S Duhau, A de la Torre

04.05 Composition of the solar wind.
(Chairman: P Bochsler)

04.05.01 ION COMPOSITON STUDIES IN RELATION TO CONDITIONS AND PROCESSES IN THE SOLAR WIND SOURCE REGION
J Geiss

04.05.02 IRON ABUNDANCE ENHANCEMENTS IN THE SOLAR WIND
J Schmid

04.05.03 SOLAR WIND FE MEASUREMENTS IN HIGH SPEED FLOWS
F M Ipavich, A B Galvin, G Gloeckler, D Hovestadt, S J Bame, B Klecker, M Scholer, L A Fisk

04.05.04 SOLAR WIND IRON CHARGE STATES PRECEDING A DRIVER PLASMA
A B Galvin, F M Ipavich, G Gloeckler, D Hovestadt, B Klecker, M Scholer

04.05.05 ON A SPECIFIC BEHAVIOUR OF ALPHA PARTICLES AND HEAVY IONS IN THE SOLAR WIND, AS STUDIED BY THE PROGNOZ 7 AND 8 SATELLITES
G N Zastenker, Yu I Yermolaev, O L Vaisberg, A N Omelchenko, N L Borodkova, L A Avanov, A A Skalski, Z Nemecek, J Safrankova

04.05.06 FIRST MEASUREMENT OF THE CARBON ABUNDANCE IN THE SOLAR WIND
G Gloeckler, F M Ipavich, D C Hamilton, B Wilken, W Studemann, G Kremser

04.05.07 FIRST MEASUREMENTS OF THE CARBON CHARGE STATE DISTRIBUTION IN THE SOLAR WIND
F M Ipavich, G Gloeckler, D C Hamilton, G Kremser, W Studemann, B Wilken

04.05.08 HELIUM AND MINOR IONS IN THE SOLAR WIND
A Buergi

04.05.09 COLLISIONAL TIME SCALES FOR TEMPERATURE AND VELOCITY EXCHANGE BETWEEN DRIFTING MAXWELLIANS
E Marsch, R Hernandez

04.05.10 OBSERVATION OF HE+ PICK-UP IONS IN THE SOLAR WIND
E Moebius, D Hovestadt, B Klecker, M Scholer, G Gloeckler, F M Ipavich

04.05.11 DISTRIBUTION OF HIGH ENERGY NEUTRALS OF PLANETARY ORIGIN IN THE INTERPLANETARY MEDIUM: INFLUENCE ON ION ABUNDANCES
M Banaszkiewicz, S Grzedzielski

04.06 Shocks. [Jointly with Division III]
(A) General Contributions
(Chairman: Steven Schwartz)

04.06.01 SOME DATA ON MICROSTRUCTURE OF BOW SHOCK
O Vaisberg, V Smirnov, L Avanov

04.06.02 PROPERTIES OF HIGH MACH NUMBER SHOCKS
Daniel Winterhalter, Margaret G Kivelson, Raymond J Walker, Christopher T Russell, Kevin B Quest

04.06.03 STRUCTURE OF THE HIGH-MACH-NUMBER PERPENDICULAR SHOCK
K Quest, C Aldrich, D Winske

04.06.05 MAGNETIC FIELD ROTATIONS OUT OF THE COPLANARITY PLANE AT FAST COLLISIONLESS SHOCKS
M F Thomsen, J T Gosling, K B Quest, D Winske, W A Livesey, C T Russell

04.06.06 FLOW PARAMETERS DYNAMICS AND ELECTROSTATIC POTENTIAL JUMP AT THE INTERPLANETARY SHOCKS ACCORDING TO SELECTIVE MEASUREMENTS OF SOLAR WIND IONS
G Zastenker, N Borodkova, A Skalsky

04.06.07 A STUDY OF THE STRUCTURE OF CHARGED PARTICLE FLOWS IN THE SHOCK WAVE
I Kozak, Z Nemecek, J Safrankova, G N Zastenker, A E Stefanovic

04.06.08 THE MOTION OF IONS SPECULARLY REFLECTED OFF A QUASI-PARALLEL SHOCK IN THE PRESENCE OF LARGE-AMPLITUDE MHD WAVES
S A Fuselier, J T Gosling, M F Thomsen

04.06.09 GYRATING AND INTERMEDIATE ION DISTRIBUTIONS UPSTREAM OF THE EARTH´S BOW SHOCK
S A Fuselier, M F Thomsen, J T Gosling, S J Bame

04.06.11 INTERACTION OF LOW ENERGY IONS WITH A REALISTIC SHOCK STRUCTURE
D Burgess

(Chairman: Eugene Greenstadt)

04.06.12 PARTICLE ACCELERATION TO 200 MEV AT A QUASI-PERPENDICULAR LAMINAR SHOCK
E T Sarris, S M Krimigis

04.06.13 CONDITIONS FOR ACCELERATION OF AMBIENT IONS TO HIGH ENERGIES (E>300 KEV) AT THE EARTH´S BOW SHOCK
G C Anagnostopoulos, E T Sarris

04.06.14 MULTISPACECRAFT OBSERVATIONS OF ION EVENTS UPSTREAM OF THE BOW SHOCK AND INSIDE THE PLASMA SHEET
G C Anagnostopoulos, E T Sarris, S M Krimigis

04.06.15 PATTERNS OF MAGNETOSPHERIC PARTICLE ESCAPE FROM THE PLASMA SHEET
E T Sarris, P C Trochoutsos, G Kaliabetsos, G C Anagnostopoulos, G P Pavlos

04.06.16 CHARACTERISTICS OF MAGNETOSPHERIC ELECTRONS (E>220 KEV) IN THE ENVIRONMENT OF THE EARTH´S BOW SHOCK
G D Kaliabetsos, E T Sarris, G C Anagnostopoulos

04.06.17 THE INTERACTION OF TWO PERPENDICULAR COLLISIONLESS SHOCKS
P Cargill, C Goodrich, K Papadopoulos

04.06.18 NUMERICAL STUDIES OF ELECTRON PLASMA WAVES UPSTREAM OF THE EARTH'S BOW SHOCK
P Canu, J Solomon, J Etcheto

04.06.19 DEPENDENCE OF SHOCK PARAMETERS ON UP- AND DOWN-STREAM PLASMA DATA
A K Richter, K C Hsieh

04.06.20 STRUCTURE OF HIGH BETA, QUASIPERPENDICULAR, SUPERCRITICAL BOW SHOCK
J D Scudder, A Mangeney, C Lacombe, C Harvey, J Gosling, G Paschmann, C T Russell, T L Aggson, C Anderson

(B) Slow shocks

04.06.21 SLOW MODE SHOCKS IN THE INNER HELIOSPHERE
A K Richter, H Rosenbauer, F M Neubauer

04.06.22 STRUCTURE OF MAGNETIC SLOW SHOCKS
D Winske, S P Gary, K Quest, E Stover, R L Tokar

13.04.04 SLOW SHOCKS IN SPACE PLASMA
A K Richter

(Chairman: Chris Hervey)

04.06.23 THE DE HOFFMAN-TELLER POTENTIAL DROP ACROSS SLOW SHOCKS
S J Schwartz, W C Feldman, M F Thomsen

04.06.24 SLOW SHOCKS IN THE MAGNETOTAIL
W C Feldman

04.06.25 A SURVEY OF ENERGETIC ION ENHANCEMENTS ASSOCIATED WITH SLOW-MODE SHOCKS OBSERVED IN THE DISTANT GEOTAIL
T R Sanderson, K-P Wenzel

(C) AMPTE

04.06.26 NUMERICAL SIMULATION OF AMPTE ION RELEASES IN THE SOLAR WIND
C Goodrich, K Papadopoulos, A T Lui, A Mankofsky

04.06.27 PLASMA WAVE MEASUREMENTS MADE ON AMPTE UKS
P J Christiansen, A G Darbyshire, M P Gough, A R W Hughes, S R Jones, A J Norris, L J C Woolliscroft

04.06.28 THE INTERACTION OF THE SOLAR WIND WITH INJECTED IONS DURING THE AMPTE LITHIUM AND BARIUM RELEASES
D J Rodgers, A D Johnstone, M F Smith, A J Coates

04.06.29 ELECTRON ENERGIZATION ASSOCIATED WITH NATURAL DIAMAGNETIC CAVITIES IN THE SOLAR WIND
D R Lepine, D S Hall, C P Chaloner, D A Bryant, R A Bingham

04.06.30 AMPTE-UKS OBSERVATIONS AT THE EARTH'S BOW SHOCK
A J Coates, A D Johnstone, D J Rodgers, M F Smith, S J Schwartz, V Formisano

(D) Planetary and cometary shocks

04.06.31 GLOBAL BOW SHOCK PROPERTIES AND THE SOLAR WIND INTERACTION WITH PLANETS AND COMETS
J A Slavin

(Chairman: O Vaisberg)

04.06.32 EFFECT OF HEAVY IONS IN THE SOLAR WIND ON THE COMETARY BOW SHOCK
N Omidi, C S Wu, D Winske

04.06.33 A POSSIBLE OBSERVATION OF A COMETARY BOW SHOCK
C T Russell, J L Phillips, M R Arghavani, J D Mihalov, W C Knudsen, K Miller

04.06.34 DEFLECTION OF THE VENUS BOW SHOCK BY INTERPLANETARY SHOCKS
M Tatrallyay, C T Russell, J G Luhmann, J D Mihalov

04.06.35 SOLAR CYCLE DEPENDENCE OF THE VENUS BOW SHOCK
C J Alexander, C T Russell

04.06.36 VENUS IONOSPHERIC RECOMPRESSION SHOCK
William C Knudsen, Kent L Miller

(E) Coronal shocks

04.06.37 SHOCK FORMATION IN THE SOLAR CORONA
R S Steinolfson

04.06.38 POSSIBLE EXISTENCE OF CORONAL SLOW SHOCKS
Y C Whang

04.06.39 PROMPT FORMATION OF QUASI-PERPENDICULAR SHOCKS IN SOLAR FLARES
C C Goodrich, P Cargill, L Vlahos

04.06.40 A POSSIBLE SCENARIO FOR THE FLARE-GENERATED CORONAL TRANSIENT AND SHOCK WAVE FORMATION AND PROPAGATION
S Pinter

04.06.41 THE ROLE OF SHOCKS IN PARTICLE ACCELERATION IN SOLAR FLARES
D F Smith (E) Coronal shocks (continued)
(Chairman: Steven Schwartz)

04.06.42 TIME-DEPENDENT CORONAL SHOCK ACCELERATION OF ENERGETIC SOLAR FLARE PARTICLES
M A Lee, J M Ryan

(F) Interplanetary shocks

04.06.43 THE EFFECT OF UPSTREAM WAVES ON INTERPLANETARY SHOCK STRUCTURE AND DOWNSTREAM WAVES
C J Alexander, C T Russell

04.06.44 PIONEER VENUS AND NEAR-EARTH OBSERVATIONS OF INTERPLANETARY SHOCKS IN 1978
J D Mihalov, C T Russell

04.06.45 FORMATION OF COROTATING SHOCKS: TWO ASPECTS - ONE RESULT
A K Richter, A H Luttrell

04.06.46 INTERPLANETARY SHOCKWAVES OBSERVED IN APRIL 1978 BY THE VOYAGER RADIO ASTRONOMY EXPERIMENT
Y Leblanc, D F Smart

04.06.47 ELF-EMISSION ON THE INTERPLANETARY SHOCKS OBSERVED ON PROGNOZ-8 AND ISEE-3
O Vaisberg, F Scarf, N Borodkova, M Nozdratchev

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Papers withdrawn from Divison IV sessions:

04.01.07 STATISTICAL ACCELERATION BY MAGNETIC IRREGULARITIES OF THE SOLAR WIND PLASMA AND ITS INFLUENCE ON THE SPECTRA OF SOLAR COSMIC RAYS AND ANOMALOUS COMPONENT OF LOW-ENERGY COSMIC RAYS
V A Smirnova

NO TITLE
M Vellante

04.03.11 LARGE SCALE STRUCTURE OF THE SOLAR WIND
J G Luhmann

04.04.08 THE QUASILINEAR THEORY OF IMF FLUCTUATIONS SPECTRUM
M E Katz, M Stehlik, Y I Fedorov, S F Nosov, B A Shakhov

04.04.11 INVESTIGATION OF MHD-TURBULENCE OF SOLAR WIND USING THE DATA OF SOLAR COSMIC RAYS
E V Kolomeets, V N Sevost´yanov

04.06.04 ON THE NATURE OF "OVERSHOOT" IN A COLLISIONLESS SHOCK
V G Eselevich

04.06.10 CORRELATED MEASUREMENTS OF DIFFUSE IONS AND LOW FREQUENCY WAVES UPSTREAM OF THE EARTH´S BOW SHOCK
M Scholer, T Terasawa, C T Russell, F M Ipavich

05.01 Workshop on magnetic observatories, survey and repeat stations.
(Convenors: E R Niblett and A J Forbes)

05.01.01 DIGITAL AND AUTOMATIC OBSERVATORY PRACTICE - A REVIEW OF THE PRESENT STATE OF THE ART
A J Forbes

05.01.02 A NEW GEOMAGNETIC OBSERVATORY FOR AUSTRIA
P Melichar

05.01.03 DIGITAL GEOMAGNETIC OBSERVATORY SYSTEM
Richard W Kuberry, Lanny R Wilson

05.01.04 AMOS III - THE CANADIAN DIGITAL MAGNETIC OBSERVATORY
D F Trigg, A Nandi

05.01.05 THE AUTOMATIC OBSERVATORY SYSTEM CURRENTLY UNDER DEVELOPMENT FOR THE UK OBSERVATORIES
A J Forbes, J C Riddick

05.01.07 THE CANADIAN DIGITAL MAGNETIC OBSERVATORY NETWORK
R L Coles, G Jansen van Beek

05.01.08 IMPROVEMENTS OF L'AQUILA'S GEOMAGNETIC OBSERVATORY AUTOMATIC SYSTEM BY MEANS OF CLINOGRAPHIC CONTROL
A Meloni, P Palangio, Q Taccetti, Anna De Santis

05.02.14 IMPROVEMENTS IN THE GEOMAGNETIC OBSERVATORY DATA ARCHIVE AT WDC-A
S J McLean, K L Svendsen, L D Morris

05.01.10 RING CORE FLUXGATE MAGNETOMETER FOR REPEAT SURVEYS, OBSERVATORY, AND ARRAY APPLICATIONS
A W Green Jr, R W Kuberry, J D Wood, B B Narod

05.01.12 THE DESIGN OF THE INDUCTIVE GEOMAGNETIC SENSOR AND DATA ACQUISITION SYSTEM
P Zhang

05.01.13 GEOMAGNETIC SURVEYING TECHNIQUES AND DATA REDUCTION PROCEDURES
D R Barraclough

05.01.14 FIRST-ORDER SURVEY AND AUSTRALIAN GEOMAGNETIC REFERENCE FIELD 1985.0
A McEwin, P McFadden, C Barton

05.01.15 EVOLUTION OF THE CANADIAN MAGNETIC REPEAT STATION NETWORK
L R Newitt, R L Coles

05.01.16 A LOCAL SURVEY OF THE NORTH MAGNETIC POLE
L R Newitt, E R Niblett

05.01.17 NEW RESULTS IN THE FRENCH ARRAY OF MAGNETIC REPEAT STATIONS
D Gilbert, J L Le Mouel

05.01.18 THE SECULAR CHANGE OF THE NORMAL GEOMAGNETIC FIELD ELEMENTS OF EGYPT BETWEEN 1965-1977 ACCORDING TO FIELD MEASUREMENTS AND IGRF
H Deebes, M Fahim, F M Ahmed, A Hassaneen, E M Ibrahim, M E Mostafa

05.01.19 THE GEOMAGNETIC COMPONENTS OF EGYPT REDUCED TO THE EPOCH 1980.0
M Fahim, H Deebes, F M Ahmed, A Gh Hassaneen

05.01.20 ANALYSIS OF THE FUNDAMENTAL EQUATION FOR REDUCTION OF ABSOLUTE MEASUREMENTS OF EARTH MAGNETIC FIELD ELEMENTS (EMFE) TO A DEFINITE EPOCH [also listed at 13.13.07]
I Butchvarov

05.01.23 SMALL-SCALE ANOMALIES OF LONG-TERM GEOMAGNETIC VARIATIONS
W Mundt, V Auster

05.01.24 A LIGHT-WEIGHT VECTOR PROTON MAGNETOMETER FOR FIELD WORK
A Kormendi

05.01.25 RESULTS OF COMPARISON MEASUREMENTS
E Kring Lauridsen

05.01.27 EXPERIENCES WITH HOME-MADE FLUXGATE MAGNETOMETERS
O Rasmussen

05.01.28 THE CALIBRATION AND AGEING OF QHMS USED BY THE BRITISH ANTARCTIC SURVEY 1957-1984
D A Simmons

05.01.29 COMPARISON MEASUREMENTS OF GEOMAGNETIC INSTRUMENTS IN HURBANOVO DURING SEPTEMBER - OCTOBER 1984
A M Zoltowski, J Podsklan, V Auster, W Zander, M Konecny, I Cholakov, T Nestianu, R Kalinin, T Lomniczi

05.01.30 SOME ASPECTS OF DATA INTEGRATION OF GEOMAGNETIC OBSERVATORY SURLARI IN THE EUROPEAN OBSERVATORY NETWORK
Andrei Soare, Alexandra Ionescu, Adrian Cosma

05.01.32 IMPROVED TEMPERATURE PERFORMANCE IN FIELD PORTABLE FLUXGATE MAGNETOMETERS
M J Valiant

05.01.26 THE MAGNETIC OBSERVATIONS AT THE CHAMBON LA FORET OBSERVATORY
M Menvielle, S Coutin, B Clave de Otaola, D Gilbert

05.01.33 A PORTABLE PROTON COMPONENT MAGNETOMETER
V Auster

05.01.34 A NEW ROTATING COIL MAGNETOMETER
J Halousek, B Pesina, K Prihoda

05.01.35 CONSTRUCTION AND PERFORMANCE OF BEIJING MAGNETIC SHIELDED ROOM
M K Shi, A F Qiu, B M Wang, Y H Yamg, B D Li

13.13.20 COMPARISON OF ABSOLUTE MEASUREMENTS BY PROTON PRECESSION MAGNETOMETER AND CLASSICAL METHOD
V Auster, E Ritter

05.02 Processing of geomagnetic data for indices and for other applications.
(Convenors: C Sucksdorff and H Nevalinna)

05.02.01 ON THE USE OF AE AND DST IN SOLAR WIND-MAGNETOSPHERE COUPLING STUDIES
W Baumjohann

05.02.03 MID-LATITUDE SIGNATURE OF AURORAL CURRENT SYSTEMS AT SATELLITE AND/OR SURFACE ALTITUDES: A COMPARISON
Marianne Mareschal, Michel Menvielle

05.02.04 THE AM, AN, AS AND AA MAGNETIC ACTIVITY INDICES: DERIVATION AND PHYSICAL MEANING
M Menvielle, A Berthelier

05.02.05 HOW TO MANAGE GEOMAGNETIC INDICES IN FUTURE
M Menvielle, A Berthelier

05.02.06 THE USE OF NIGHTTIME HOURLY MEANS TO DETERMINE SECULAR CHANGE
Joseph C Cain, Barbara V Dodge

05.02.07 HOURLY MEAN PROCESSING FOR SEPARATION OF ACTUAL SQ RUN
T Lomniczi

05.02.08 DIGITAL AND ANALOG FILTERING OF GEOMAGNETIC OBSERVATORY DATA
A W Green Jr

05.02.09 RESULTS OF SIMPLE REDUCTION OF SECULAR POINT MEASUREMENTS AT HIGH LATITUDES (FINLAND)
C Sucksdorff

05.02.10 A WAY TO OUTLINE SOME REGIONAL AND LOCAL PECULIARITIES OF THE LONG PERIOD GEOMAGNETIC VARIATIONS
Adrian Cosma

05.02.12 INVESTIGATION OF MAGNETIC INDICES FOR REGISTRATION OF THE WHOLE SPECTRUM OF GEOMAGNETIC VARIATIONS
K Lengning, V Auster, A Best THURSDAY 15 AUGUST 1985

05.02.13 AURORAL ELECTROJET (AE) INDICES: PROCESSING, ACCURACY, PROBLEMS
J H Allen, H W Kroehl

05.02.15 THE GROUNDBASED GEOMAGNETIC DATA BASE DEVELOPMENT AND THE GEOMAGNETIC INDICES CALCULATION
V O Papitashvili, V G Petrov, A N Zaitzev

05.02.16 NEW JOINT INTERNATIONAL GEOMAGNETIC CATALOG, UAG-92
C C Abston, N E Papitashvili, V O Papitashvili

05.02.17 A NEW CONCEPT OF THE AUTOMATED GEOMAGNETIC DATA BASE SYSTEM FOR THE WORLD DATA CENTERS
C C Abston, N E Papitashvili, V O Papitashvili

05.02.18 COMPARISON OF K INDEX VALUES DERIVED FROM LA COUR MAGNETOGRAMS, COMPUTER PLOTTED MAGNETOGRAMS AND NUMERICAL METHODS
A M Allen, A J Forbes, A G Greenwood, J S McNab, E M Reader, K Walmsley

05.02.19 AN EVALUATION OF DIGITALLY DERIVED K-INDICES
Lanny R Wilson

05.02.21 ON THE COMPUTER PRODUCTION OF K-INDICES
P A Hopgood, P McFadden

05.02.22 USE OF DIGITAL HIGH-PASS FILTER FOR K-INDEX DETERMINATION
K Nowozynski, J Jankowski, W F Stuart, C Sucksdorff
ADAPTIVE SEPARATION OF QUASI-REGULAR AND IRREGULAR MAGNETIC ACTIVITY FOR DERIVATION OF K-INDICES
J K Walker

01.01.13 COMPARATIVE RESULTS OF 3 MODELS APPLIED TO EXTRAPOLATE THE ISOGONIC CHART OF PERU 1985
Lucia Villanueva

05.01.31 HOMOGENEITY OF MAGNETIC VARIATIONS IN THE SURROUNDINGS OF THE NURMIJARVI OBSERVATORY
Jerzy Jankowski, Risto Pirjola, Tomasz Ernst

13.14.26 ON THE EFFECT OF USING EXCLUSIVELY BZ<0 (BS) FOR THE CORRELATION WITH THE AE-INDEX
L Rossberg

05.04 Division V reviews.
(Convenor: W F Stuart)

05.04.06 THE HEALTH OF THE MAGNETIC OBSERVATORY NETWORK
K L Svendsen XXX
13.13.44 DECLINE IN GLOBAL GEOMAGNETIC OBSERVATIONS FROM 1976-1984
M A Shea, J H Allen
05.04.05 REPORT ON MAGNETIC SURVEYS AND CHARTS
N J Skinner
05.04.07 GEOPHYSICAL ALERTS AND FORECASTS: A GLOBAL INTEREST
Jo Ann Joselyn
13.13.51 TERRESTRIAL EFFECTS OF SOLAR ACTIVITY FROM GEOMAGNETIC DATA
J H Allen
05.04.02 REVIEW OF AIRGLOW CALIBRATION ACTIVITIES
Hans Lauche
CORRECTED GEOMAGNETIC COORDINATES
G Gustaffson
SCIENTIFIC REQUIREMENTS FOR OBSERVATORY DATA AND JUSTIFICATION FOR A WORLD-WIDE NETWORK
E R Niblett, R L Coles
PLANS FOR FUTURE MAGNETIC SURVEY SATELLITES AND MAGNETIC OBSERVATORIES
G Backus

05.05 Special Topic group on geophysical alerts and forecasts.
(Convenor: JoAnn Joselyn)

POSTER INTRODUCTION
JoAnn Joselyn
05.05.01 SOME FIELD PROGRAM REQUIREMENTS FOR GEOMAGNETIC FORECASTS
Wallace H Campbell
05.05.02 IMPACT OF GEOSPACE ON TERRESTRIAL TECHNOLOGY
L J Lanzerotti
05.05.03 A GEOMAGNETIC FORECASTING SCHEME
Syun-Ichi Akasofu
05.05.04 CORONAL TRANSIENTS GENERATED AT THE BASE OF A STREAMER
R S Steinolfson
05.05.05 SOLAR MAGNETIC FIELD DISTRIBUTION AND GEOMAGNETIC ACTIVITY
V Bumba, L Hejna
05.05.06 THE ROLE OF MAGNETOTAIL DYNAMICAL PROCESSES IN PRODUCING GEOMAGNETIC ACTIVITY
D N Baker
05.05.07 FORECASTING THE RING CURRENT FROM SOLAR WIND MEASUREMENTS
R L McPherron
05.05.09 PROOF OF IONOSPHERIC ORIGIN OF PIC - MAGNETIC PULSATIONS AS OBSERVED BY MAGSAT OVER AND THOSE ON THE GROUND BELOW A PULSATING AURORA
T Oguti, T Yamamoto, K Hayashi, R Fujii

05.05.10 GEOMAGNETIC STORMS - THE ROLE OF DISAPPEARING FILAMENTS
C S Wright
05.05.11 GEOMAGNETIC FORECASTING AT THE SYDNEY WARNING CENTRE
R J Thompson
05.05.12 OBSERVATIONS OF SOLAR CORONAL HOLES AT THE FLEURS OBSERVATORY
R J Thompson
05.05.13 MULTI-ZONE GEOMAGNETIC ACTIVITY FORECASTS FOR CANADA
R L Coles, J Hruska
05.05.15 FLARES AND SUBSEQUENT AURORAL ELECTROJET DISTURBANCES
L Krivsky, F Zloch
05.05.17 THE SOLAR CAUSES OF GEOMAGNETIC DISTURBANCES
V P Mikhailutsa, M N Gnevyshev
05.05.18 DO IONOSPHERIC DISTURBANCE CURRENTS FLOW AT MID-LATITUDES?
G M Brown, S H M Jones
05.05.19 POSSIBLE INTERNAL MODULATION OF THE GEOMAGNETIC ACTIVITY BY NEUTRAL GAS DENSITY VARIATIONS OF THE UPPER ATMOSPHERE
G Sonnemann
05.05.20 PREDICTING POLAR CAP FLUX
R L McPherron
05.05.21 IMF POLARITY AND GEOMAGNETIC ACTIVITY
L Triskova MONDAY 12 AUGUST 1985

Papers withdrawn from Division V sessions:

05.01.06 A DIGITAL AUTOMATIC STATION FOR GEOMAGNETIC MEASUREMENTS
I Arshinkova, A Bochev, N Abadjiev, K Arshinka, E Zacharieva, V Velev, Y Mandil
05.01.11 A NEW DATA LOGGING SYSTEM FOR THE BRITISH ANTARCTIC SURVEY
R I Kressman, D A Simmons
05.01.22 DIFFERENCES OF SECULAR VARIATION OF THE TOTAL FIELD ON THE TERRITORY OF SLOVAKIA
J Podsklan
05.02.02 REQUESTED QUALITY OF GEOMAGNETIC DATA FOR AE INDICES
Tohru Araki, Toyohisa Kamei
05.02.11 NONORTHOGONAL SPECTRAL ANALYSIS
A Anufriev
05.05.08 ENERGETICS OF MAGNETIC DISTURBANCES AND THEIR SOURCES
V M Mishin
05.05.14 LOWER HYBRID HEATING OF IONOSPHERIC IONS DUE TO ION RING DISTRIBUTIONS IN THE CUSP
I Roth
05.05.16 CONTRIBUTION OF IONOSPHERIC CURRENTS TO SC
Tohru Araki

Interdivisional Commission on Antarctic Research
SCAR Upper Atmosphere Physics Working Group

Minutes of Business Meeting:
18.30hrs, 12 August 1985; continued 17.30hrs, 13 August, 1985

Chairman: A N Zaitzev USSR
Acting secretary: R Haggard RSA

Present:

G B Burns	AUSTRALIA
Ts P Dachev	BULGARIA
S Fisher	CZECHOSLOVAKIA
H Gernandt	DDR
A Grafe	DDR
A W V Poole	RSA
J P S Rash	RSA
M W J Scourfield	RSA
P R Sutcliffe	RSA
R B Horne	UK
P J Hurren	UK
M Pinnock	UK
A J Smith	UK
S-I Akasofu	USA
D L Carpenter	USA
U S Inan	USA
L J Lanzerotti	USA
C G Maclennan	USA
M H Rees	USA
T J Rosenberg	USA
H D Voss	USA
A D Danilov	USSR
N G Kleimenova	USSR
V P Kim	USSR

1.&2.: Opening Remarks, and Future of IDCAR

The Chairman stressed that IDCAR activities were complex with much overlapping with other groups and IAGA divisions. At present IDCAR has the same status as divisions but the IAGA Executive Committee had decided that its function had to come to an end, since the 5 divisions within IAGA are sufficient to cover all aspects of the work done. The IAGA President had stated that working groups could no longer independently organize their own sessions. The IAGA Executive Committee has recommended that IDCAR either becomes absorbed within Divisions II and III or becomes an interdivisional working group bound to Division V. No steps will be taken by IAGA Executive Committee during this Assembly but change is definitely planned for the next Assembly (Vancouver, 1987) so we should discuss our situation and relationship with SCAR-

UAPWG. M J Rycroft commented that Antarctic research is not being demoted, but may be better served by joining up with SCAR-UAPWG. A D Danilov commented that whatever IDCAR did we would never overcome the problem of symposia overlapping.

M H Rees suggested the possibility of forming a joint working group on Antarctic research of Divisions II and III in place of IDCAR. M J Rycroft summarised the discussion by noting that the general feeling seemed to be against attaching IDCAR to Division V. There seemed to be more support for a joint working group of Divisions II and III, although there is some Division I and IV interest. The Chairman's counter proposal was for an interdivisional working group, but M H Rees cautioned that, by becoming an interdivisional working group, IDCAR could spread itself too thinly and none of the Divisions might want to include IDCAR papers in their sessions. Thus IDCAR should seriously consider becoming a working group of Divisions II and III.

A vote of show of hands was taken on two proposals:
(i) Joint working group of IAGA Divions II and III (11 votes)
(ii) Interdivisional working group on Antarctic Research (9 votes).
There were 3 abstentions

Since no clear majority decision could be reached, the Chairman suggested that members consider all facets of the problem and reconsider IDCAR's position at the Vancouver General Assembly.

3. Proposals

3.1 SCAR meeting in South Africa, 1986
Upper Atmosphere Physics Working Group
(i) Nagata Symposium on Geomagnetically Conjugate Studies; Reviews accepted:

T Nagata	"Geomagnetic Conjugate Phenomena of Polar Substorms".
K D Cole	"Upper Atmosphere Asymmetries between the Hemispheres".
R A Helliwell	"Active VLF Wave Experiment between Siple Station, Antarctica, and Roberval, Canada".

(ii) Workshop on Antarctic Middle and Upper Atmosphere Physics. Reviews proposed:

R S Harwood	"Midwinter Warmings in Arctic and Antarctic Stratosphere".
J A Gledhill	"Particle Precipitation Patterns In Southern Hemisphere High Latitudes; Longitude Dependence"
T J Rosenberg	"Cosmic Noise Absorption Phenomena at High Latitudes".

G Brasseer/ S Soloman	"Particle Impact to the Middle Atmosphere in Polar Latitudes and Associated Aeronomic Processes".
M H Rees	"Auroral Precipitation"
A N Other	"Climatology and Dynamics of the Middle Atmosphere at High Southern Latitudes".

(iii) Workshop on Co-ordinated Data Analysis Periods 10-13 and 27-29 June 1982.
Convenor: L J Lanzerotti

3.2 IUGG General Assembly - Vancouver, 1987.
The following topic for IDCAR at next General Assembly was adopted:
"Recent Antarctic Research Results with special emphasis on comparison with satellite observations above Antarctica and the development of unmanned Geophysical Stations".
A N Zaitsev and M J Rycroft agreed to approach chairmen of Divisions II, III and V with a view to their accommodating Antarctic Research at Vancouver. Failing this, IDCAR would try to organize its own symposium.

4. Resolutions for IAGA consideration
Four resolutions were adopted for consideration by IAGA resolution committee which will be submitted by M J Rycroft on the Chairman's behalf. The adopted resolutions read:

(i) Recognizing that wave-induced charge particle precipitation from the magnetosphere can produce a variety of significant effects in the lower ionosphere, IAGA recommends that funding agencies continue to support all worthwhile experiments on wave-particle interactions (e.g. ground-based ULF magnetometers, ELF/VLF wave transmitters and receivers, riometers, and instruments aboard satellites in polar orbits) and to provide commensurate support for the analysis of the various valuable data sets now being obtained.

(ii) Recognizing that there are no experimental results on the geomagnetic conjugacy of the convection of ionospheric plasma across the polar cap, and recognizing that this conjugacy is expected, on theoretical grounds, to depend markedly upon the orientation of the interplanetary magnetic field, IAGA recommends that funding agencies should endeavour to support the deployment of novel optical instruments and H F Doppler radars in the Antarctic, and further recommends, as do several individual Divisions of IAGA, that space agencies should do their utmost to enable the interplanetary magnetic field to be continuously measured just upstream of the magnetosphere.

(iii) Recognising that little is known of the dynamics and energetics of the Antarctic stratosphere, mesosphere and lower thermosphere, and noting the importance of applying in situ and remote sensing techniques to the study of these regions, IAGA recommends that attempts be made to investigate this

region of near-earth space by ground-based, rocket and satellite experiments.

(iv) Recognizing that there is a complete lack of data on the structure and dynamics of the lower thermosphere within the polar regions, and recognising that a significant amount of energy from the sun and magnetosphere, in the form of charged particle precipitation and other electrodynamic processes, is deposited in this region, IAGA recommends that several lower polar orbiting satellites, carrying a wide range of instruments observing both in situ and by remote sensing means, investigate the upper atmosphere in order to study the physics of magnetosphere - ionosphere - thermosphere - mesosphere interactions on a global scale.

5. Data analysis of SCAR special period - June 1982

5.1 Magnetometers.

S-I Akasofu reported that 20 stations sent in data, some in digital form, others not. His staff digitized all the data and produced composite plots for each day. The 20 stations are: Alfred-Faure, Syowa, Faraday, Halley, Macquarie Island, Martin de Vivies, Mawson, Mirny, Port Aux Francais, SB53, SC61, Scott, SD62, SE56, Terre Adelie, SA51. Belgrano, Sanae, Davies, Novolazarevskaya. This was the first time that Southern Hemisphere AU, AL and AE indices had been produced. He will try to derive the equivalent horizontal current systems.

5.2 Riometers.

T J Rosenberg reported that 11 stations had sent in data viz: Dumont d'Urville, McMurdo, Davies, South Pole, Syowa, Macquarie Island, Novolazarevskaya, Campbell Island, Siple, Sanae and Kerguelen. Voss reported that SEEP satellite data on energetic particles, optical emissions and X-rays are available over Antarctic during June 1982. Halley data were given to Rosenberg at the meeting.

5.3 Ionosondes.

R Haggard reported that Rhodes had received f plots from Argentine Islands and Dumont d'Urville, besides Sanae data, which showed long periods of blackout conditions prevailing. M Pinnock stated that Halley data had just been despatched. It was suggested that Professor Gledhill write to all the Antarctic station operators requesting the missing data and then analyse and correlate the data for distribution to all interested parties as soon as possible. L Lanzerotti agreed to contact Berkey and to send South Pole data to Gledhill. G Burns similarly agreed to contact Australian and New Zealand groups in this regard.

5.4 VLF and ULF.

D Carpenter reported that comprehensive data from 4 stations had been received viz., Siple, Halley, Sanae and Kerguelen. An atlas of plasmapause sample Siple data had been prepared.

Particular scientific problems that could be tackled had been identified.

5.5 Other.
Auroral Imaging, Photometer, etc., Satellite (X-ray imaging and NOAA precipitating particles) and geomagnetic pulsation data are as yet an unknown quantity due to the fact that H Fukunishi is still in the Antarctic and his substitute N Sato did not attend IAGA Assembly. The Chairman (A Zaitzev) undertook to investigate the data situation of the Soviet Antarctic stations and their subsequent distribution.

6.0 International Programmes in Antarctica
The Chairman reported on successful balloon flights during the 1984/85 season and also on the June 1982 co-operative project. Future projects involved simultaneous balloon launches from Syowa, Dumont d'Urville, South Pole and McMurdo and he also informed the meeting of the planned launches from South Pole station by the University of Houston Group this coming summer season. There was a possibility of participation from Mirny as well.
M Rycroft enquired whether the Soviets had considered balloon-satellite communications as a British Group under the leadership of Professor Evans of the Department of Electronics and Electrical Engineering, University of Surrey, Guildford, Surrey, is using the UDSAT satelite to collect data.

Incoherent Scatter Radar Programme for the Southern Hemisphere: R Haggard reported that V Wickwar will prepare a discussion paper for the SCAR 1986 meeting in South Africa on utilizing surplus equipment from present Northern Hemisphere radars. It was generally accepted that international co-operation would be required since costs would be very high - perhaps of the order of $10 million - and no single national programme could support the facility. Further problems would be availability of a suitable Antarctic site with the necessary power supply generator system. Possible sites include Syowa, Molodezhnaya and McMurdo, although the latter might be too far within the polar cap. Nevertheless, it has the most suitable infrastructure and support facilities at present.

S Fisher reported on the Czechoslovakian Astronomical Institute negotations with the relevant authorities with a view to participation in the international Antarctic research programme and a Czechoslovakian presence in Antarctica, initally starting with an Intercosmos satellite telemetry station.

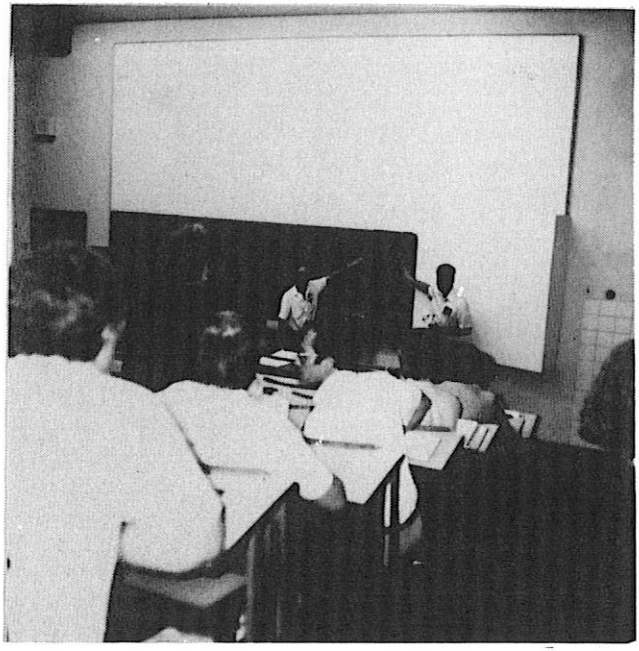
H Gernandt reported on the DDR Middle Atmosphere programme, particularly ozone and aerosol distribution programmes, using ground-based, balloon and rocket instruments in the Antarctic. It was suggested that he draw up a planning document for SCAR consideration at the South African meeting in 1986.

R Haggard reported on the South African Antarctic programme and noted that there was no change since the Bremerhaven meeting and that the four South African Solar Terrestrial Groups had agreed to work on the June 1982 events by organizing local workshops.

G Burns reported on the Australian Antarctic programme modernization of magnetometers and riometers so as to obtain data in digital format. He also mentioned the Fabry-Perot interferometer installation at Mawson as well as the monitoring of magnetic pulsations in the cusp region. He informed the meeting that ground-based atmospheric electric field and conductivity measurements were being made at Davis station.

M Rycroft reported that the UK stations were still operating as per last SCAR meeting and that H Gough was to install a ULF pulsation experiment at Halley, which was designed to investigate the modulation of whistler mode waves by ULF modes. He further reported that hopes of establishing a HF radar facility at Halley were being frustrated by the lack of funds.

There being no other business, the meeting was adjourned at 1900hrs.



INTERDIVISIONAL COMMISSION ON
ANTARCTIC RESEARCH

06.01 Antarctic ionospheric and magnetospheric studies - systematic observation, understanding and theory: AIMSOUTH

06.01.01 RECENT PROGRESS IN, AND FUTURE PROSPECTS FOR, ANTARCTIC IONOSPHERIC AND MAGNETOSPHERIC STUDIES - SYSTEMATIC OBSERVATION, UNDERSTANDING AND THEORY: AIMS SOUTH
Michael J Rycroft

06.01.02 THERMOSPHERIC-IONOSPHERIC INTERACTION BY SATELLITE AND GROUND-BASED DATA FOR THE SOUTHERN POLAR REGION
Ts Dachev, J G Carignan, P Velinov, Y Matviichuk, I Rumchev, H Spasov, K Serafimov, I Kutiev

06.01.03 VARIATIONS OF ELECTRON DENSITY HEIGHT DISTRIBUTION IN THE POLAR CAP IONOSPHERE ABOVE ANTARCTICA
A V Shirochkov, L N Makarova

06.01.04 THREE CONJUGATE-PAIR OBSERVATIONS NEAR L=6
N Sato, R Fujii, H Fukunishi, T Hirasawa, T Araki, S Kokobun, Y Tonegawa, Th Saemundsson

06.01.05 DYNAMICS OF THE GEOMAGNETIC DISTURBANCES IN THE SOUTHERN POLAR CAP
V O Papitashvili, A N Zaitzev

06.01.06 RECENT RESEARCH ON MAGNETOSPHERIC WAVE-PARTICLE INTERACTIONS
R A Helliwell, U S Inan, J P Katsufrakis, D L Carpenter, T F Bell, E W Paschal

06.01.07 OCCURRENCE CHARACTERISTICS OF VLF WAVE ACTIVITY AT HALLEY, ANTARCTICA
A J Smith, P Jenkins

06.01.08 PULSATIONS OF PIlC TYPE IN THE DAYSIDE AURORAL OVAL
V A Troitskaya, O V Bolshakóva, O K Borovkova

06.01.09 DAYTIME LONG PERIOD GEOMAGNETIC PULSATIONS AT CONJUGATE ARCTIC AND ANTARCTIC AREAS
O V Bolshakova, N G Kleimenova, N A Kurazdakovskaya, A N Zaitzev, E Friis-Christensen

06.01.10 THE EFFECTS OF PARTICLE PRECIPITATION ON THE E-LAYER IN THE SOUTH ATLANTIC ANOMALY REGION
R Haggard

06.01.11 THE SPORADIC-E LAYER AND ELECTRON PRECIPITATION OVER THE SOUTH ATLANTIC ANOMALY DURING PROJECT ISAAC
R Haggard

06.01.12 SEASONAL DIFFERENCES IN AURORAL RADIO ABSORPTION
S Krishnaswamy, T J Rosenberg

06.01.13 MESOSPHERIC OZONE IN THE SOUTH ATLANTIC ANOMALY
W R Sheldon, J R Benbrook, P Fabian

06.01.14 RESEARCH ON ANTARCTIC MIDDLE ATMOSPHERE AT SYOWA STATION
T Hirasawa, Y Iwasaka

06.01.15 IDENTIFICATION OF MAGNETOSPHERIC CONVECTION PATTERNS AND DIAGNOSIS OF MAGNETOSPHERE STATE BASED ON GROUND-BASED OBSERVATIONS IN ANTARCTICA
O A Troshichev

06.01.16 EMPIRICAL MODEL OF THE IONOSPHERIC F2 LAYER TROUGH FOR JUNE SOLSTICE IN THE SOUTHERN HEMISPHERE
A S Besprozvannaya, T I Shchuka

INTERDIVISIONAL COMMISSION ON
HISTORY

07.01 Historical records in geophysics and space physics.
(Convenors: J Feynman and H B Garrett)

07.01.03 BRIGHT NIGHTS
M Herse

07.01.04 CRITICAL USE OF HISTORICAL DATA IN GEOPHYSICS AND AERONOMY
Asgeir Brekke

07.01.05 THE RED AURORAS OF FEBRUARY 11, 1958 AND OTHERS
Syun-Ichi Akasofu

07.01.06 HISTORICAL RECORDS OF AURORAE OBSERVED ON THE SAME DAYS IN THE OCCIDENT AND ORIENT
N Fukushima, A Egeland, L-Z Jin, Q-L Liu, S M Silverman, M Teboul

07.01.07 MAGNETIC OBSERVATIONS ON OR NEAR SOUTH GEORGIA 1700-1984
D A Simmons

07.01.08 WORLD CATALOGUE OF POLAR AURORA <55N FOR YEARS 1000-1900 AND LONG-RANGE SOLAR ACTIVITY
L Krivsky

07.01.09 THE CONFIRMATION OF SECULAR VARIATION OF 14C PRODUCTION USING ARCHAEOLOGIC AND HISTORICAL SAMPLES
Rainer Berger

07.02 Events in geophysics and space physics and the people that made them happen.
(Convenors: W Schroeder and H B Garrett)

07.02.01 ANNOTATIONS ON THE FIRST MATHEMATICAL FORMULATION OF FARADAY'S INDUCTION LAW BY C F GAUSS 150 YEARS AGO
M Siebert

07.02.02 EARLY CHINESE ATMOSPHERIC PHYSICS IN WANG CHUNG'S BOOK - LUN HEN (BALANCING DISCOURSES)
Hu Xin-ru

07.02.03 CHRISTOPHER HANSTEEN (1784 - 1876), A PIONEER IN THE FIELD OF TERRESTRIAL MAGNETISM
A Brekke, A Egeland

07.02.04 OTTO JESSE - A PIONEER IN UPPER ATMOSPHERIC PHYSICS
W Schroeder

07.02.05 PEDRO NUNEZ AND THE FIRST PRINTED TREATISE ON TWILIGHT OBSERVATIONS
M Gadsden

07.02.06 DEVELOPMENT OF CZECHOSLOVAK GEOPHYSICS
V Bucha

07.02.07 XXVI CENTURIES OF FLOODS OF THE TIBER
G P Gregori, M P Pavese

Interdivisional Commission on the Middle Atmosphere

Business Meeting
August 7. 1985

J Taubenheim, Chairman

1. Reports oF Working Groups

As the Working Groups will meet during the following week, the WG Chairmen gave only short reports on their activities, which were mainly related to preparing the present symposium programme at the Prague Assembly. There was general agreement that the existing four Working Groups of the InterDivisional Commission should continue at least till the next IUGG/IAGA Assembly in 1987.

2. Future of the InterDivisional Commission

After a thorough discussion, the meeting felt that the spectrum of problems to be studied in middle atmosphere research also in future will need an interdisciplinary approach, with inputs from several fields of IAGA's activities, and in contact with the corresponding IAMAP commission. Therefore it was recommended to maintain the IAGA inter-divisional body for these tasks at least during the period of the International MAP/MAC programmes, with its objectives as defined at the InterDivisional Commission meeting in Hamburg 1983.

3. Programme for Vancouver 1987

The meeting welcomed an information about an IUGG Symposium on the Middle Atmosphere, planned for three half-day sessions on the IUGG General Assembly at Vancouver 1987. This underlines the significance attributed by IUGG to the Middle Atmosphere Programme and provides a platform for competent review papers. In view of several MAP activities (second GLOBUS campaign, Super-CAMP, etc.) forthcoming in the next years, the meeting felt an urgent need for the opportunity to present and discuss an expected considerable number of more detailed results in a Middle Atmosphere Symposium of IAGA, which should cover about 5 full days, in addition to the above IUGG Symposium. It is strongly desirable that the programmes of both the IUGG and the IAGA Symposium are worked out in close coordination between the IAGA and IAMAP bodies responsible for middle atmosphere cooperation (i.e., the InterDivisional Commission and the ICMUA, respectively).

In the discussions of the Business Meeting took part:
J Taubenheim and P C Simon (Co-Chairmen), J Lastovicka, G Megie and G E Thomas (WG Chairmen), S A Bowhill, A Ebel, I Hirota, W A Matthews and J J Olivero.

INTERDIVISIONAL COMMISSION ON
THE MIDDLE ATMOSPHERE

08.01 UV radiances, cross sections, photochemical modelling.
(Chairman: P C Simon)

08.01.01 VARIATIONS IN SOLAR ULTRAVIOLET IRRADIANCE: SME OBSERVATIONS JANUARY 1982 THROUGH JUNE 1985 [Also listed at 13.13.92]
G J Rottman

08.01.02 ULTRAVIOLET SOLAR FLUX VARIATIONS
Donald F Heath

08.01.03 SOLAR UV FLUX VARIATIONS AND THE SOLAR HEI LINES, CA K 1A INDEX, SUNSPOT NUMBER, AND 10.7CM, EUV AND SOFT X-RAY FLUXES
R F Donnelly

08.01.04 ULTRAVIOLET SOLAR IRRADIANCE MEASUREMENT FROM 200 TO 340 NM ON BOARD SPACELAB 1
G Thuillier, P C Simon, D Labs, H Neckel, R Pastiels

(Chairman: J Taubenheim)

08.01.05 RECENT IMPROVEMENTS IN SOLAR UV IRRADIANCE MEASURMENTS
Paul C Simon

08.01.06 SOME ASPECTS OF THE MIDDLE ATMOSPHERE CHEMICAL COMPOSITION AND ITS NUMERICAL SIMULATION
A M Zadorozhny

13.13.92 VARIATIONS IN SOLAR ULTRAVIOLET IRRADIANCE: SME OBSERVATIONS JANUARY 1982 THROUGH JUNE 1985
Gary J Rottman

08.02 Solar-terrestrial forcing of the middle atmosphere.
(Chairman: R F Donnelly)

08.02.01 SOLAR-TERRESTRIAL RELATIONSHIPS AT THE LOWER IONOSPHERE DYNAMICS
E S Kazimirovsky

08.02.02 OBSERVATIONS OF SOLAR ACTIVITY INDUCED VARIATIONS IN MIDDLE ATMOSPHERE TRACE SPECIES, HEATING AND MOTIONS
John C Gille, Charles M Smythe, Guy Brasseur

08.02.03 SOLAR CYCLE VARIATION OF MESOSPHERIC TEMPERATURES
G von Cossart, J Taubenheim

08.02.05 SOLAR AND DYNAMICALLY INDUCED OSCILLATIONS IN THE STRATOSPHERE
S Chandra

08.02.06 CONTROL OF PARTICLE PRECIPITATION INTO THE MIDDLE ATMOSPHERE BY REGULAR CHANGES OF THE INTERPLANETARY MAGNETIC FIELD
J Bremer

08.02.07 THE INTERPLANETARY MAGNETIC FIELD SECTOR STRUCTURE AND THE MIDDLE ATMOSPHERE
J Lastovicka

08.02.08 SOURCE REGION OF ENERGETIC ELECTRON PRECIPITATION BETWEEN L-VALUES 3 AND 6
A Ranta, H Ranta

13.13.46 GLOBAL PERTURBATIONS OF STRATOSPHERIC OZONE FOLLOWING UV SOLAR MAXIMUM AND THE ERUPTION OF EL CHICHON
Donald F Heath, Leslie Cheng, Barry Schlesinger

08.02 Solar-terrestrial forcing of the middle atmosphere.
(Chairman: J Lastovicka)

08.02.09 GLOBAL PERTURBATIONS OF STRATOSPHERIC OZONE FOLLOWING UV SOLAR MAXIMUM AND THE ERUPTION OF EL CHICHON [Also listed at 13.13.46]
D F Heath, L Cheng, B Schlesinger

08.02.10 SHORT TERM CHANGES IN OZONE AND 1.27 MICRON EMISSION ASSOCIATED WITH SOLAR ULTRAVIOLET VARIATIONS AS MEASURED BY THE SME SATELLITE
Arthur C Aikin, H J P Smith

08.02.11 STRATOSPHERIC OZONE AND THERMAL RESPONSES TO CHANGES IN SOLAR ULTRAVIOLET FLUX ON THE TIME SCALE OF THE SOLAR ROTATION PERIOD
L L Hood

08.02.12 RADIATIVE-PHOTOCHEMICAL MODELLING OF OZONE MECHANISM OF SUN-EARTH RELATIONSHIPS
I L Karol, A A Kiselev, E V Rosanov

08.02.13 OBSERVED AND PREDICTED RESPONSE OF MIDDLE ATMOSPHERE TO SHORT-TERM SOLAR UV VARIATIONS
G Keating, G Brasseur

08.02.14 STATISTICAL SIMULATION OF SUDDEN IONOSPHERIC DISTURBANCES
Ya Lastovichka, L P Morozova

08.02.15 EXTERNAL FORCING IN THE LOWER D REGION. MODEL CALCULATIONS
G Satori

08.02.16 LATITUDINAL DEPENDENCE OF PARTICLE PRECIPITATION IN THE MIDDLE AND UPPER ATMOSPHERE DURING PERIODS OF MAGNETOSPHERIC STORMS
P Velinov, K Serafimov, G Moraitis, H Spasov, J Tasev

08.04 Short-lived species in the middle atmosphere, including results of MAP-GLOBUS
(Chairman: W A Matthews)

08.04.01 THE MAP/GLOBUS PROJECT: OBJECTIVES AND CAMPAIGN DESCRIPTION
D Offermann

08.04.02 STRATOSPHERIC NO PROFILES FROM SIMULTANEOUS MEASUREMENTS OF TWO CHEMILUMINESCENT BALLOON-BORNE SONDES
P Fabian, G Flentje, W A Matthews

08.04.03 STRATOSPHERIC HO2 ALTITUDE PROFILES MEASURED BY MATRIX ISOLATION AND ESR
M Helten, W Paetz, D N Ehhalt, E P Roeth

08.04.04 RADICALS MEASUREMENTS DURING MAP/GLOBUS CAMPAIGN
J P Pommereau

08.04.05 BALLOON-BORNE MEASUREMENTS OF STRATOSPHERIC POSITIVE AND NEGATIVE IONS DURING THE MAP/GLOBUS CAMPAIGN 83 AND INFERRED GAS PHASE SULPHURIC ACID AND ACETONITRILE ABUNDANCES
H Schlager, F Arnold

(Chairman: M Helten)

08.04.06 MESOSPHERIC OZONE: OBSERVATIONS AND RESULTS FROM THE SOLAR MESOSPHERE EXPLORER SPACECRAFT
R J Thomas

08.04.07 OZONE VARIANCE AND WAVE ACTIVITY IN THE MESOSPHERE
G E Thomas, D E Siskind, R J Thomas

08.04.08 THE VARIABILITY OF STRATOSPHERIC RADICALS
J A Pyle, A M Zavody

08.04.09 RECENT OBSERVATIONS OF STRATOSPHERIC TRACE GASES [Abstract at 12.03.21]
M T Coffey, W G Mankin

08.04.10 STRATOSPHERIC TRACE GAS DETECTION BY BALLOON-BORNE CHEMICAL IONISATION MASS SPECTROMETRY
J Hofmann, F Arnold

08.04.11 TRACE GAS DETECTION IN THE TROPOSPHERE AND LOWER STRATOSPHERE USING AIRCRAFT-BORNE CHEMICAL IONISATION MASS SPECTROMETRY
G Knop, F Arnold

08.05 Long-lived species, including results of MAP-GLOBUS.
(Chairman: G Megie)

08.05.01 CBRCLF2 (CFC-12B1) IN THE ATMOSPHERE
P Fabian, R Borchers, S Lal, B C Krueger

08.05.02 A STUDY OF THE VERTICAL DISTRIBUTION OF METHYLCHLORIDE (CH3CL) IN THE MIDLATITUDE STRATOSPHERE
U Schmidt, D Knapska, S A Penkett

08.05.03 THE VERTICAL DISTRIBUTION OF CCL2F-CCLF2 (CFC-113) AND CCLF2-CCLF2 (CFC-114) IN THE STRATOSPHERE
R Borchers, P Fabian, B C Krueger, S Lal, U Schmidt, D Knapska, S A Penkett

08.05.04 THE STRATOSPHERIC WATER BUDGET AND TROPOSPHERE TO STRATOSPHERE EXCHANGE
R L Jones, J A Pyle, A M Zavody

08.05.05 MODELLING OF STRATOSPHERIC LONG-LIVED SPECIES
L J Gray, J A Pyle

08.05.06 SOURCE, RESERVOIR AND SINK GASES MEASUREMENT DURING MAP/GLOBUS CAMPAIGN
P Fabian

08.07.03 REDUCTIONS IN ION DENSITY ASSOCIATED WITH SULFURIC ACID AEROSOL INCREASES AT 30 KM
D J Hofmann, J M Rosen

08.05.11 DETERMINATION OF SOLAR ABUNDANCES FROM THE MEASUREMENTS OF D2/D1 RATIOS USING SPECTRAL SCANNING POLARIMETER
M R Tade, D B Jadhav, R C Landge, A J Kamatgi, A D Tillu

08.05 Long-lived species, including results of MAP-GLOBUS.
(Chairman: W A Matthews)

08.05.08 RESULTS FROM BALLOON OZONE INTERCOMPARISON CAMPAIGN (BOIC) [Also listed at 13.13.48]
E Hilsenrath

08.05.10 OZONE MEASUREMENTS DURING THE MAP/GLOBUS CAMPAIGN
Gerard Megie, Paul C Simon
13.13.36 HOW WELL DO MODELS SIMULATE STRATOSPHERIC RADICAL DISTRIBUTION?
Uta Schmailzl

08.06 Noctilucent clouds and high-latitude aeronomy
(Chairman: G E Thomas)

08.06.01 RESULTS OF NOCTILUCENT CLOUDS RESEARCH IN THE LAST DECADE
O Avaste, A Lazarev, O Vasilyev, Ch Willmann
08.06.02 THE COLD ARCTIC MESOPAUSE PROJECT, CAMP - 1982
E Kopp
08.06.03 NOCTILUCENT CLOUD OCCURRENCE AND WINDS IN THE LOWER THERMOSPHERE
M Gadsden
08.06.05 POLAR MESOSPHERIC CLOUDS: CLOUDS AT THE EDGE OF SPACE
John Olivero
08.06.06 EISCAT OBSERVATIONS OF ELECTRON DENSITY VARIATIONS IN THE DISTURBED IONOSPHERIC D-REGION
T Devlin, J K Hargreaves, P N Collis
13.11.03 THE DYNAMICAL MODEL OF SUSPENDED AEROSOLS IN THE LOWER TURBULENT ATMOSPHERE
G M Teptin, L V Morozova
13.14.22 LASER STUDIES OF METEORIC DUST CLOUDS
V N Sharma

08.07 Interactions between ionized and neutral components of the middle atmosphere.
(Chairman: A D Danilov)

08.07.01 INCOHERENT SCATTERING AND CHEMICAL FLUCTUATIONS IN THE MESOSPHERE
J Wisemberg, G Kockarts
08.07.02 INTERACTIONS BETWEEN METAL IONS AND NEUTRAL SPECIES AT THE MESOPAUSE LEVEL
J P Jegou
13.02.02 SEARCH FOR GASEOUS METAL COMPOUNDS IN THE STRATOSPHERE AND MESOSPHERE USING PASSIVE CHEMICAL IONISATION MASS SPECTROMETRY WITH HIGH MASS RESOLUTION
O Moehler, F Arnold
08.07.04 POSITIVE ION COMPOSITION MEASURED IN THE D AND LOWER E REGION DURING POLAR WINTER
A Goetzelmann, D Krankowsky, P Laemmerzahl
08.07.05 FIRST COMPOSITION MEASUREMENT OF ATMOSPHERIC POSITIVE AND NEGATIVE IONS AROUND THE STRATOPAUSE, USING A NOVEL PARACHUTE-BORNE MASS SPECTROMETER PROBE
K Pfeilsticker, F Arnold

08.07 Interactions between ionized and neutral components of the middle atmosphere.
(Chairman: E Arijs)

08.07.06 THE ROLE OF NO AND OF TURBULENCE IN THE IONOSPHERIC D-REGION
A D Danilov

08.07.08 D REGION IONS AND WATER VAPOR VARIATIONS NEAR THE MESOPAUSE
J Taubenheim, B S N Prasad

08.07.09 AN ANALYSIS OF THE INTERACTION OF NEUTRAL AND IONIZED COMPONENTS IN THE LOWER THERMOSPHERE
P Bencze

08.07.10 ESTIMATION OF THE NO CONCENTRATION FROM IONOSPHERIC DATA
J Boska

(Chairman: A D Danilov)

08.07.12 A COMPREHENSIVE MODEL OF THE NEGATIVE ION COMPOSITION BETWEEN 0-60 KM ALTITUDE
K Pfeilsticker, F Arnold

08.07.13 DETECTION OF H+(H2O)NCO2 MIXED CLUSTERS IN THE STRATOSPHERE
H Schlager, F Arnold

08.07.14 SEASONAL VARIATION OF MESOSPHERIC OPTICAL DEPTH AND NO IONIZATION RATE BY LYMAN-ALPHA RADIATION
S A Maurits, A V Shirochkov

08.07.15 EFFECT OF NITRIC OXIDE CHEMISTRY AND TRANSPORT ON THE DIURNAL VARIABILITY OF RADIO WAVE ABSORPTION IN THE IONOSPHERE
K V V Ramana, D Indira Devi, D N M Rao, T S N Somayaji, Tata Arunamani

InterDivisional Commission on Internal/External Geomagnetic Relations

Business Meeting, August 12, 1985

The attendance has been as follows:

D E Winch, Chairman	(AUSTRALIA)
R G Rastogi	(INDIA)
W H Campbell	(USA)
E Oni	(NIGERIA)
V R S Hutton	(UK)
D M Schlapp	(UK)
E C Butcher	(AUSTRALIA)
F H Hibberd	(AUSTRALIA)
G M Brown	(UK)
G P Gregori	(ITALY)
U Schmucker	(FRG)

The meeting has discussed the topics of interest relevant to the InterDivisional Commission and decided upon the following:

1. Sq and L (Morphology, Dynamo Theory, and Solar-Terrestrial Relations)
2. Disturbance Variations
3. Equatorial Electrojet
4. Conductivity of the Earth from Magnetic Fields

The meeting discussed and decided upon the following Resolution:

IAGA
recognizing that methods for data handling, analysis, and interpretation are often used by only a few authoritative scientists, and
recognizing the need for promoting the widest possible diffusion of knowledge among scientists of different disciplines,
recommends
to study and make the necessary organization arrangements in order to publish on a permanent basis a series of small self-contained volumes (and an update of relevant IGY manuals), which constitutes a self-renewing handbook, containing, in clear and simple statements, the physical assumptions of each method, its conclusions, applied formulas, and whenever possible, computer programs, in standardized units and symbols, and to point out the importance of such publication to scientists, especially those from developing countries.

The meeting suggested a recommendation to IAGA for Chairmanship and Vice-Chairmanship of the InterDivisional Commission on Internal/External Geomagnetic Relations from 1987 for 4 years as follows:

W H Campbell (USA) Chairman
V P Singh (INDIA) Vice-Chairman

The meeting has discussed and proposed two Symposia to be held at Vancouver in 1987, taking each one half a day session:

I- Quiet time external current systems including Sq, L, electrojet and magnetospheric origin
Convenors: W H Campbell and E C Butcher

II Conductivity investigations using external current systems
Convenors: G P Gregori and E Oni.

Report of Session 9.2, received 20 September 1985, from Wallace H Campbell:

"Techniques and Results of Earth Conductivity Determinations using External/Internal Fields"

The first half of the session was chaired by W H Campbell and the second half by G P Gregori. The papers at this session may be divided into four groups:

(A) Characteristics of the Earth's upper mantle region
T J Shankland discussed the electrical properties of the composition models for the mantle region, V Cermak presented the temperature profiles of the region, and G Calcagnile discussed the general properties of the lithosphere and asthenosphere.

(B) Nature of the source fields
J C Cain drew our attention to some special effects of external geomagnetic sources, and J Pecova considered the distribution of long-period fields.

(C) Analysis methods
M S Zhdanov presented the latest information on EM spatial analysis methods, W D Parkinson reviewed the limitations in the use of spherical harmonic analysis methods, D E Winch outlined the mathematical procedures for Sq and L studies, and U Schmucker discussed improved ways for obtaining deep conductivity profiles.

(D) Conductivity determinations
G P Gregori presented some results of the canonical methods, N M Rotanova interpreted some conductivity models in terms of geothermic properties, B A Hobbs presented global conductivity results, W H Campbell compared conductivity measurements from several continental regions, and M Menville showed evidence of lateral herogeneity in upper mantle conductivity. Papers by Duba, Fainberg et al., Jady and Praus were not presented.

INTERDIVISIONAL COMMISSION ON
INTERNAL/EXTERNAL GEOMAGNETIC RELATIONS

09.01 Three-dimensionally conceived Sq, L and electrojet fields.
(Convenor: E Oni)

09.01.02 VERTICAL CROSS SECTION OF THE EQUATORIAL ELECTROJET FROM ROCKET DATA
C A Onwumechili, P C Ozoemena

09.01.03 HORIZONTAL CROSS SECTION OF THE EQUATORIAL ELECTROJET FROM SATELLITE DATA
C A Onwumechili, P C Ozoemena

09.02 Techniques and results of Earth conductivity determinations using external/internal fields.
(Convenors: Wallace H Campbell and Giovanni P Gregori)

09.02.02 PHYSICAL EXPLANATIONS OF MANTLE CONDUCTIVITY: CONSEQUENCES FOR ELECTRICAL MODELS
T J Shankland

09.02.03 TEMPERATURE PROFILES IN THE EARTH OF IMPORTANCE TO DEEP CONDUCTIVITY MODELS
Vladimir Cermak, M Lastovickova

09.02.04 PROPERTIES OF THE LITHOSPHERE-ASTHENOSPHERE SYSTEM IN EUROPE WITH A VIEW TOWARD EARTH CONDUCTIVITY
G Calcagnile, G F Panza

09.02.05 EFFECTS OF EXTERNAL SOURCES ON SPHERICAL HARMONIC ANALYSIS
Joseph C Cain, Duane Nelson, Christopher Kluth, Dave Schmitz

09.02.07 SPATIAL VARIATION OF LONG PERIOD GEOMAGNETIC VARIATION AND IMPLICATIONS FOR THE EARTH'S CONDUCTIVITY STRUCTURE
J Pecova, K Pec, Z Martinec

DEEP ELECTROCONDUCTIVITY MODEL BASED ON GLOBAL MAGNETOVARIATION SOUNDING AND ITS GEOTHERMAL INTERPRETATION
Dimitriev, Rotanova, Fisrina, Zarharova

09.02.09 THE PLANETARY SCALE PATTERN OF TELLURIC CURRENTS
B Alessandrini, G P Gregori, L J Lanzerotti, W H Campbell

09.02.10 THE APPLICATION OF THE ELECTROMAGNETIC FIELDS SPATIAL ANALYSIS METHODS FOR THE DETERMINATION OF THE EARTH CONDUCTIVITY
M S Zhdanov

09.02.11 LIMITATIONS IN THE USE OF SPHERICAL HARMONIC METHODS FOR DEEP CONDUCTIVITY DETERMINATIONS
W D Parkinson

09.02.12 MATHEMATICAL LIMITATIONS IN THE APPLICATION IN SPHERICAL ANALYSES TO SQ AND L STUDIES
D E Winch

09.02.13 IMPROVED LOCAL RESPONSE ESTIMATES FOR SQ AND THE CONCEPT OF UNIFORM SUBSTITUTE CONDUCTORS
U Schmucker

09.02.14 CONDUCTIVITY PROFILES FROM GLOBAL DATA
B A Hobbs

09.02.15 DEEP CONDUCTIVITY DETERMINATIONS FOR NORTH AMERICA, EUROPE, AND ASIA
Wallace H Campbell

09.02.17 EXPERIMENTAL EVIDENCES OF LATERAL HETEROGENEITY OF CONDUCTIVITY IN THE UPPER MANTLE
M Menvielle, J L Counil, J L Le Mouel

09.02.16 MODELS OF DEEP CONDUCTIVITY USING MAGNETIC VARIATIONS WITH PERIODS GREATER THAN ONE DAY
R J Jady

09.04 General contributions of external/internal fields.
(Chairman: D E Winch)

09.04.01 THE CHAPMAN-WHITEHEAD THEORY OF INDUCTION IN THE EARTH
D E Winch

09.04.02 ON THE GROUND MAGNETIC VARIATION PRODUCED BY IONOSPHERIC ELECTRIC CURRENTS
C Mazaudier

09.04.03 SYNOPTICS OF THE EXTERNAL ORIGIN GEOMAGNETIC FIELD BY CANONICAL GDS
G P Gregori, B Alessandrini, L J Lanzerotti, W H Campbell, A Meloni, C Valenti

13.13.77 DESCRIPTION OF THE EARTH MAGNETIC FIELD WITH MODEL KOSIK 84
J C Kosik

09.04.04 SOME RECENT INVESTIGATIONS OF THE DAY-TO-DAY VARIABILITY OF SQ
R J Mann, D M Schlapp

09.04.05 ON POSSIBLE CAUSES OF ABNORMAL QUIET DAYS (AQDS) IN SQ(H)
E C Butcher

09.04.06 THE CHARACTERISTICS OF SQ(H) DAILY VARIATIONS AT THE MIDDLE LATITUDES IN CHINA
C F Liu

13.14.10 SQ VARIABILITY AND MAGNETIC ACTIVITY
G K Mukherjee

09.04.08 MAGNETIC FIELD MEASUREMENTS IN THE IONOSPHERE-MAGNETOSPHERE REGION
A Bochev, I Arshinkov MONDAY 5 AUGUST 1985

Papers withdrawn from IDCs' sessions:

07.01.10 SIXTEENTH CENTURY AURORAE AND SUNSPOTS AND THE SOLAR CYCLE
D J Schove

08.01.07 ONE DIMENSIONAL MODELLING STUDIES OF THE VERTICAL PROFILES OF HALOCARBONS AND HYDROCARBONS AT 44N
S A Penkett, A M Hough, A E J Eggleton, U Schmidt, D Knapska

08.01.08 HEATING RATE DUE TO ULTRA-VIOLET ABSORPTION BY OZONE OVER INDIA
L S Hingane

08.02.04 THE MIDDLE ATMOSPHERE TEMPERATURE AND OZONE MODULATION CAUSED BY SOLAR UV AND CORPUSCULAR RADIATION
I G Dyominov, A M Zadorozhny

08.05.07 STUDY OF AEROSOL LAYER VARIATION BY TWILIGHT METHOD
D B Jadhav

08.05.09 OZONE RESULTS FROM THE BALLOON INTERCOMPARISON CAMPAIGN
D Robbins, J Waters, P Zimmermann, R Jarnot, J Hardy, H Pickett, S Pollitt, W Traub, K Chance, N Louisnard, W Evans, J Kerr

08.06.04 THE NUCLEATION OF ICE UNDER NOCTILUCENT CLOUD CONDITIONS
A F Roddy

08.07.07 ION-CHEMICAL MODELS FOR THE IONIZATION BALANCE OF THE MIDDLE ATMOSPHERE
B S N Prasad

08.07.11 LONGITUDINAL EFFECTS IN ABSORPTION VALUES CHANGE DURING WINTER PERIOD IN MIDDLE LATITUDES
K A Karimov

13.13.68 VARIATION OF IONOSPHERIC CURRENTS AND ELECTRICAL CONDUCTIVITY CAUSED BY THE SOLAR ACTIVITY
Masahiko Takeda, Tohru Araki, Yuji Yamada

09.02.01 LIMITS TO ELECTRICAL CONDUCTIVITY MODELS DUE TO THE COMPOSITION OF THE EARTH'S MANTLE
A G Duba

09.02.08 PLANETARY SCALE DISTRIBUTION OF TELLURIC CURRENTS
E B Fainberg, A V Kuvshinov, B Sh Singer

Report on the Symposium on Dynamics and Remote Sensing of the Middle Atmosphere

Sponsored by IAMAP's International Commission on the Meteorology of the Upper Atmosphere (ICMUA) and held during the 5th Scientific Assembly of IAGA, Joint Meeting with IAMAP Commissions in Prague, Czechoslovakia, 5-17 August 1985

Convenors: A Ebel, R G Roper

The Symposium on Dynamics and Remote Sensing of the Middle Atmosphere organized by ICMUA in connection with IAGA's Symposium on the Aeronomy of the Middle Atmosphere was the continuation of a series of Middle Atmosphere Science Sympposia (MASS). This highly successfully series commenced in 1981, resulting in fruitful and stimulating cooperation between IAMAP and IAGA, the leading scientific International Associations in the field of middle and upper atmosphere research.

The symposium on dynamics and relevant observational methods consisted of eight sessions.

(1) Progress in remote sensing techniques (Chaired by S Kato)
9 papers presented

It was demonstrated that the MST radars have become a very important tool for observing the middle atmosphere, supplying us with significant information about mean winds, waves and turbulence. The technique gives resolutions as excellent as several hundred meters and a few minutes in height and time, respectively. Note that the number of MST radars in operation has been increasing, presenting a good global network for observing middle atmosphere dynamics. It was shown that the EISCAT radar can produce valuable information about E-region dynamics such as tides and shorter-term variations.

Global and local measurements of ozone and other minor constituents were discussed in various talks. A promising new technique is the sounding of the middle atmosphere in the mm-wave range (e.g., the mass limb-sounder, which will allow simultaneous measurements of H_2O, O_3, ClO, pressure and temperature from the troposphere up to lower thermospheric heights). Ground-based microwave measurements of the mesospheric water vapour have been discussed. A comparison of temperature profiles as derived by two rocketborne techniques, namely IR spectrometry and falling spheres, showed systematic differences in the measurements.

(2) Dynamics of the stratosphere, including troposphere coupling (Chaired by A O'Neill, G Schmitz)
8 papers presented

Evidence was presented from numerical simulation that gravity waves excited by orography influence large-scale motions by momentum deposition in the stratosphere and upper troposphere. Several papers using satellite data for dynamical studies of the stratosphere were given. Problems relating to transient/stationary wave interactions and of wave activity during summer, to the thermal and momentum budgets during stratospheric warmings, to enstrophy budgets and to nonlinear processes were discussed. Interesting results about the dynamics of the tropical stratosphere were derived from balloon and rocket soundings which exhibited significant differences with longitude for long period zonal wind oscillations and specific reactions of the low latitude stratopause region to stratospheric warmings.

(3) Dynamics of the mesosphere and lower thermosphere (chaired by S K Avery, Yu I. Portnyagin)
14 papers presented

The session opened with a review of the characteristics of the windfield over Saskatoon, Canada. Examples of mean winds, planetary waves, tides, and gravity waves were presented. Interactions between different scales of motion were discussed and zonal wind accelerations deduced from gravity wave data were presented. The effects of planetary waves were investigated in a subsequent paper using M.F. radar observations from Adelaide. Strong planetary wave activity was found below 80 km in winter. The decrease of amplitude at larger heights was attributed to gravity wave effects.

Evidence for the influence of stratospheric and mesospheric dynamics (e.g., planetary waves, stratospheric warmings) on lower ionospheric processes was demonstrated in several contributions. The significant role of solar and geomagnetic activity was also stressed. Indications of an aeronomic modulation of geomagnetic activity have been found. In contrast, correlation analyses of Poker Flat wind data and ground-based magnetic field measurements did not reveal significant correlations.

First results from the Japanese MU radar were presented, and results of airglow structure observations obtained from coordinated imaging and Michelson interferometer experiments were discussed.

(4) Circulation models of the middle atmosphere (Chaired by K Rose
7 papers presented

A critical review was given of the achievements and shortcomings of the mechanistic dynamical models of the middle atmosphere on the one hand and on the more sophisticated

general circulation models on the other. Whereas the former category provides valuable tools for studying physical mechanisms, the latter aim toward an integral description of all major physical processes and meteorological phenomena. Validation of general circulation models is now possible to a large extent through the use of existing satellite data of the middle atmosphere. Two papers emphasized the impcrtance of cross-isobar flow. A combined analysis of satellite data and numerical simulation runs indicates that strong temperature gradients can develop from frontogenic activity in the stratosphere. Using a mechanistic 3-D model it was demonstrated that regional gravity wave momentum sources can generate planetary modes in the mesosphere. Dynamical conditions appropriate to noctiluclent cloud formation have been investigated using a two-dimensional dynamical model. Finally, the middle atmospheric diabatic circulation as derived from satellite observations of temperature, 0_3, H_20 and NO_2 was discussed.

(5) Tides, gravity waves and turbulence (Chaired by A H Manson, R A Vincent [part 1] and H Teitelbaum [part 2])
22 papers presented

The first part was devoted primarily to observations of mesopheric gravity waves with particular emphasis on such important properties as their climatology, horizontal scales and energy and momentum fluxes. The contributions to this session show the steady improvement in our knowledge in this field since the last symposium in Hamburg.

In the opening paper, mesospheric observations of gravity waves taken at Adelaide ($35^{o}S$) and Saskatoon ($52^{o}N$) were described. It was shown that the convergence of u'w' fluxes in the vertical implied body forces that were in the correct sense to balance the Coriolis torques induced by the mean meriodional flow. Horizontal scale sizes inferred from the Adelaide dual beam technique are in good agreement with those measured by the more direct space station (GRAVNET) observations made at Saskatoon. By combining these observations with others made with different techniques, it was found that the scale size increased with increasing period, an effect that can be attributed to the action of dissipation. Finally, the temporal variability of wave fluxes was emphasized and attention was drawn to the semi-annual variations in the short period wave energy activity with the minimum in activity occurring at the equinoxes.

Characteristics of gravity waves have been studied using rocket and radar wind measurements. About 65% of the gravity wave energy appears to be upgoing. Energy density is not conserved, which indicates wave breaking. Strong directional filtering of gravity waves seems to occur in the middle atmosphere large-scale flow as indicated by Saskatoon M.F. radar measurements of wind fluctuations at mesospheric levels. Measurements by the mobile SOUSY/VHF station in Andoya and

Andenes (Norway) were presented. They reveal significant wind oscillations at periods of 12, 16 24 and 54 hours besides fluctuations in the period range of gravity waves. Gravity wave signatures have also been found in EISCAT measurements at higher ionospheric altitudes. Laser measurements of vertical temperature profiles are indicative of vertical propagation of gravity waves with breaking levels around 60 km. The regularity of structure with height is very noticeable and differs from most of the radar and rocket wind profiles which show less monochromatic behaviour.

Mean wind and tidal amplitude and phase profiles derived from about two years of Poker Flat M.S.T. data were presented. They compare very well with the established tidal climatology from Saskatoon. Also a comparison of tides from Adelaide (35^{o}S) and Kyoto (35^{o}N) was carried out. Both 12 and 24hr tides showed strong evidence of antisymmetric modes. In a theoretical paper, the role of seasonal and latitudinal variations in eddy diffusion in the formation of asymmetries in tidal modes was emphasized.

Problems of modelling gravity wave spectra observed by M.S.T. radars were treated in an invited paper. It was shown that the spectral parameters clearly depend on the experimental parameters. This result was confirmed by a subsequent paper. Both studies addressed the problem of interpretation of measured wind fluctuations in the framework of universal gravity wave spectra. Moreover, theoretical results show that in a rotating system a gravity wave which encounters a critical level can be over-reflected even when the Richardson number of the mean flow is higher than 0.25. On the other hand, for high Reynolds number, the reflection and transmission coefficients are the same with and without viscosity.

Tidal waves are important in the lower equatorial thermosphere, not only in the generation of mean zonal wind but also because of their contribution to the transport of heat and minor constituents. Numerical simulations of tidal winds when compared with measurements seem to show that the knowledge of tidal sources must be improved.

As far as turbulence is concerned, some preliminary results of the MU (Middle and Upper atmosphere) radar in Japan demonstrate the capability of the system and its performance. Six months of continuous observations of mesospheric turbulence in Australia were analyzed with respect to seasonal changes of diffusivity and kinetic energy dissipation. Furthermore, it has been deduced from the behaviour of the sporadic layer over Hungary that lower thermospheric turbulence decreases during stratospheric warmings.

From radiance measurements made aboard the Nimbus-6 satellite, it has been deduced that large scale fluctuations contribute to vertical mixing in the mesosphere. Finally, large scale

wind fluctuations interpreted as some sort of macroturbulence seem to produce very important horizontal diffusiion.

(6) Climatology of the middle atmosphere (Chaired by I Hirota, Yu. P Koshelkov)
8 papers presented
General results and highlights are as follows:
(a) there is progress in observational techniques, for instance satellite experiments, MST radars, meteor radars etc.;
(b) much middle atmosphere data of improved quality has accumulated in the last decade;
(c) there has been an expansion of the regions of interest covered with climatological data sets, e.g., the southern hemisphere and the lower thermosphere;
(d) several analytical representations of meteorological parameter fields in the middle atmosphere have been formulated;
(e) statistics of the middle atmosphere variability have improved together with
(f) greatly improved empirical models of the ozone distribution.

Problems which deserve more intensive treatment in future climatological studies are, among others, the asymmetry between the northern and southern hemispheres, differences between the eastern and western hemisphere, and the year-to-year variability of the middle atmosphere. Some of the results presented during this session will be incorporated in the new CIRA.

(7) Coupling between photochemistry and transport in the middle atmosphere (Chaired by C A Reddy)
10 papers presented
The session started with a paper on 3-D numerical simulation studies of interrelated chemical and dynamical processes. This presentation set the tone of the session and covered most of the aspects which were also discusssed in the nine additional contributions. These topics were: the interrelationships between ozone, temperature, and transport processes; photochemistry and loss of odd oxygen; effects of sudden stratospheric warmings on ozone; and possible photochemical oscillations and resonances in the mesopause region. On the whole, the session served well the objective of bringing together the results of the interactions between dynamical photochemical and chemical processes in the middle atmosphere. From the papers presented it was obvious that scientists dealing with minor constitutents and photochemicaL processes have to increase their appreciation of the dynamical processes, while the scientist dealing with middle atmosphere dynamics has to develop an insight into the feedback mechanisms which influence the dynamical motions through the interactions of photochemical and transport processes.

(8) Winter in Northern Europe: results from MAP-WINE (Chaired by E Thrane, E Kazimirovsky)
25 papers presented

Two half-days were devoted to this session, which was the first comprehensive presentation of the achievements of the MAP/WINE campaign at an international scientific meeting of the IAGA and IAMAP Commissions. It was prepared with the generous help of the coordinator of MAP/WINE, U von Zahn, who opened the session with a review of the project.

Representatives of various task groups reported results obtained from close cooperation of the MAP/WINE participants. Problems concerning large-scale structure analysis (stratosphere and lower mesosphere, upper mesospheric winds, energy characteristics of synoptic processes in the MA, morphology and variability of the high and mid-latitude ionosphere during the campaign in the winter 1983/84), numerical simulations of the winter circulation, the diagnostics of density, temperature and electrodynamical parameter measurements, and the evaluation of temporal and spatial variations at various scales were discussed. A comparison between wind measurements with foil clouds, falling sphere and MST radar emphasized the value of using complementary techniques. A study of the tides during the MAP/WINE campaign was presented showing that the question of tidal oscillations in the MA at higher latitudes is rather controversial and that more work is needed in this field in the future.

Several authors treated observations of small-scale dynamical features of the MA e.g., the vertical structure of wind perturbations, "wind corners," small scale turbulence, creation and persistence of turbulent layers, and plasma properties and processes at higher levels. Furthermore, results from rocketborne composition measurements (water vapour, ozone, oxygen and related species) were presented and discussed together with other observations made during the MAP/WINE period. The influence of geomagnetic activity on MA processes during MAP/WINE was also analyzed.

Acknowledgement

This review of the Symposium on Dynamics and Remote Sensing of the MA is based on the reports prepared by the Chairmen of the individual sessions. The Convenors gratefully acknowledge the contributions of the Chairmen which, in no small measure, ensured the success of this symposium.

Report on Workshop

"Downward Penetration of Solar Activity Effects Into the Middle Atmosphere",

held in Prague, Czechoslovakia, 14 August 1985 during the 5th Scientific Assembly of IAGA, joint with IAMAP Commissions.

Co-convenors: A D Belmont, A Ebel

The Workshop was organized by the Working Group on Solar-Terrestrial Relationships of the IAMAP International Commission on the Meteorology of the Upper Atmosphere (ICMUA). It consisted of invited reviews on five major topics:

1. Variability of solar radiation (P C Simon, Belgium)
2. Corpuscular and geomagnetic effects (K D Cole, Australia)
3. Diagnostic and statistical studies of the atmospheric response to solar variability (G Keating, USA)
4. Mechanisms and models: radiation and photochemistry (L B Callis, USA)
5. Mechanisms and models (G Brasseur, Belgium)

Eleven poster papers related to these topics were contributed by other authors and discussed in the reviews given by the invited speakers. The main purpose of the workshop was to contribute to the study of possible mechanisms of solar activity effects in the middle atmosphere down to lower stratospheric heights.

In the first report, the quality and availability of solar activity data was addressed with special emphasis on quasi-periodic changes due to the solar cycle and solar rotation. A 13-day periodicity of solar UV-fluxes is clearly indicated in recent satellite measurements in addition to a more intense 27-day oscillation corresponding to the sun's rotation period. Both periodicities are reasonably well simulated in existing empirical UV-models, whereas such models still predict solar cycle changes less accurately.

Corpuscular and geomagnetic effects (2nd topic) cause perturbations mainly of the lower thermosphere and upper mesosphere. Direct dynamical effects of polar cap phenomena, e.g. the polar electroject, seem to be less efficient than originally thought. On the other hand, wind observations indicate significant changes with Ap variations at shorter periods (1 - 4 weeks). For longer periods, changes of the thermospheric NO source related to solar activity appear to be a promising mechanism for the generation of solar activity effects also at lower layers through the role of nitric oxide for ozone chemistry.

As outlined in the third review statistical studies are an important and unavoidable tool for the recognition of solar activity induced changes. Satellite data give evidence that the main response of the middle atmosphere to solar UV flux variations due to the sun's rotation is found in the upper stratosphere in accordance with the prediction of photochemical models. A fascinating feature of solar-induced changes is a highly significant 13-day periodicity in the ozone mixing ratios of the upper stratosphere (photo-chemical equilibrium regime) following similar changes in the solar UV fluxes around 200 nm as found from Nimbus 7 data. It is possible to reproduce this correlation with photochemical models. This gives strong evidence that the ozone layer plays a key role for the generation of atmospheric perturbations correlated with solar activity. This conclusion was supported by statistical studies showing the strongest reponse of the ozone layer to solar variability at lower latitudes.

In addition to this direct effect of solar UV flux changes there seems to exist an indirect response of the middle atmosphere as indicated by significant coherence estimates derived from atmospheric temperature and solar activity parameters. Most pronounced perturbations appear to occur at middle latitudes near the stratopause.

The physical mechanism relating the possible direct and indirect response are not yet understood. A solution to this problem may be achieved from future numerical simulation studies taking into account the complex coupling of dynamical, photochemical and radiative processes. Using a stationary 2-dimensional, photochemical model for the derivation of ozone and related differential heating changes and applying them to a numerical model of stationary planetary waves, estimates of wave amplitude and phase changes for the solar cycle could be obtained. They are indicative of significant effects in the lower mesosphere and of only weak variations at lower levels, e.g. around the tropopause. As regards shorter time scales of 2 - 4 weeks corresponding to solar rotation, 3-dimensional numerical simulation of the middle atmosphere circulation gives evidence that perturbations induced in the upper stratosphere can propagate downwards to lower levels when the mean zonal circulation shows reduced inertial stability.

STATISTICS - by country

a) Number of registrants; b) Number of authors of papers

ARGENTINA	1	15	AUSTRALIA	17	36	AUSTRIA	5	10
BELGIUM	10	11	BOTSWANA	1	1	BRAZIL	3	12
BULGARIA	16	38	CANADA	29	82	CHINA	7	48
CUBA		1	*CSSR	190	66	DENMARK	9	8
EGYPT	4	6	FINLAND	15	18	FRANCE	48	89
GERMANY (DDR)	11	22	GERMANY (FRG)	92	137	GREECE	3	7
HONG KONG	1	1	HUNGARY	26	22	ICELAND		1
INDIA	9	68	INDONESIA		1	IRAQ	1	
IRELAND		1	ITALY	13	21	JAPAN	24	68
KOREA		1	MEXICO	2	5	NETHERLANDS	6	9
NEW GUINEA	1		NEW ZEALAND	1	4	NIGERIA	3	4
NORWAY	8	18	PERU	1	2	POLAND	15	16
PORTUGAL	1		ROUMANIA	5	5	SOUTH AFRICA	6	10
SPAIN	4	3	SUDAN	1	1	SWEDEN	17	13
SWITZERLAND	17	22	TAHITI		1	TAIWAN	1	
TURKEY	1	2	UK	75	124	USA	239	545
USSR	50	432	YUGOSLAVIA	5	4			

ALL COUNTRIES 994 2011

* The number of registrants shown for Czechoslovakia [CSSR] includes 130 members of staff of the Geophysical Institute, Prague

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JEGOU,J.P.
SERVICE D'AERONOMIE DU CRNS
BP3 91370 VERRIERES LE BUISSON
FRANCE:

KOSIK,J.C.
CNES, DIV. MATHEMATIQUES
AV. E. BELIN
31055 TOULOUSE CEDEX
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LAJ,C.
CENTRE DES FARBLES-RADIOACTIVITES
UGCFR PHYSPAC
91191 GIFSURYVETTE CEDEX
FRANCE:

LE MOUEL,J.L.
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FRANCE:

MADELEINE,B.
SMITH-DAIGNIERES LAB.DE PALEOMAGN.
PLACE EUGENE BATAILLEN
34060 MONTPELLIER CEDEX
FRANCE:

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U.S.T. BATAILLON
MONTEPELLIER 34060
FRANCE:

MAZAUDIER,C.
CRPE
4 AVENUE DE NEPTUNE
94107 ST. MAUR DES FOSSES
FRANCE:

MEGIE,G.
SERVICE D AERONOMIE CNRS
BP 3
91371 VERRIERES LE BUISSON
FRANCE:

MENVILLE,
LAB.DE GEOMAG.IPGP
TOUR 14 K PLACE JUSSIEN
PARIS F 75230,CEDEX 05
FRANCE:

MOREELS,G.
C.G.T.T.
8 RUE DE SEZE
75009
FRANCE:

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45045 ORLEANS CEDEX
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FRANCE:

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FRANCE:

ROCHETTE,P.
IRIGIUM
BP 68
38402 SAINT MARTIN D'HERES CEDEX
FRANCE:

ROPERCH
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FRANCE:

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92131 ISSY-LES-MOULINEAUX
FRANCE:

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BORDAS-DUROD GANDHIER VILLARO
17 RUE REMY DUMONCEL,BP 50
75661 PARIS CEDEX 14
FRANCE:

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92131 ISSY LES MOULINEAUX
FRANCE:

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LAB.METEOROLOGIE DYNAMIQUE
ECOLE POLYTECHNIQUE
91128 PALAISEAU
FRANCE:

TIXIER,M.
15 RUE D'ANJOU
86000 POITIERS
FRANCE:

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THERESIENSTR. 41
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INST. F. ALLG. UND ANGEW. GEOPHYSIK
MUNCHEN
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RADIOASTRONOMISHES INST.
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5300 BONN
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PF 20
KALTENBURG-LINDAU 3411
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PF 20
D 3411 KATLENBURG-LINDAU 3
FEDERAL REPUBLIC OF GERMANY:

DUM,C.
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D8046 GARCHING
FEDERAL REPUBLIC OF GERMANY:

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INST. GEOPH. METEOROLOGY
UNIV. OF COLOGNE
D 5000 COLOGNE 41
FEDERAL REPUBLIC OF GERMANY:

FABIAN,P.
ZUR AKELE 7
D-34 GOTTINGEN
FEDERAL REPUBLIC OF GERMANY:

FAHR,A.
INSTITUT F. ASTROPHYSIK
AUF DEM HUGEL 71
D5300 BONN 1
FEDERAL REPUBLIC OF GERMANY:

FLUCHE,B.
BENZSTR.2B
D-3400 GOTTINGEN
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INST.GEOPHYS.WISSENSCH.
FREIE UNIV.RHEINBABENALLEE 49
D-1000 BERLIN 33
FEDERAL REPUBLIC OF GERMANY:

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FEDERAL REPUBLIC OF GERMANY:

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NLFB
POSTFACH 150153
D 3000 HANNOVER 51
FEDERAL REPUBLIC OF GERMANY:

HASS,H.
FEDERAL REPUBLIC OF GERMANY:

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K F A, ICH-3
POSTFACH 1913
D5170 JULICH
FEDERAL REPUBLIC OF GERMANY:

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SANPFERCHECKWEG
D-6900 HEIDELBERG
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MAX-PLANCK-INSTITUT F. AERONOMIE
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D-3411 KATLENBURG-LINDAU
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COLOQUE INST. F. GEOPHYSICS
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FEDERAL REPUBLIC OF GERMANY:

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D 44 MUNSTER
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D-3411 KATLENBURG-LINDAU
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MAX PLANCK INST. F. AERONOMIE
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3411
FEDERAL REPUBLIC OF GERMANY:

KOUKER,W.
MPI FUR LUFTCHEMIE
SAARSTR.23
D-6500 MAINZ
FEDERAL REPUBLIC OF GERMANY:

KRUGER,B.C.
MPI F.AERONOMIE
POSTFACH 20
D 3411 KALTENBURG-LINDAU 3
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M-P-I. F. EXTRATERRESTRISCHE PHYSIK
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D 5300 BONN 1
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PF 2341 HERZBERGER-LANDSTR. 180
D 3400 GOTTINGEN
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MOHLER,O.
MPIK-HD
SAUPFERCHECKWEG 1
D-6900 HEIDELBERG 1
FEDERAL REPUBLIC OF GERMANY:

NEUBAUER,F.M.
INST. F. GEOPHYSIK U. METEOROLOGIE
UNIV. KOLN, ALBERTUS MAGNUS PLATZ
D 5000 KOLN 41
FEDERAL REPUBLIC OF GERMANY:

OELHAF,H.
METEOROLOG.INST.UNIV.MUNCHEN
THERESIENSTR.37
D-8000 MUNCHEN 2
FEDERAL REPUBLIC OF GERMANY:

OFFERMANN,D.
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D 56 WUPPERTAL 1
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D8046 GARCHING
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INST.F.ALGEM.U. ANGEW.GEOPHYS.
THERESIENSTR.41
8000 MUNCHEN 2
FEDERAL REPUBLIC OF GERMANY:

PETZOLD.K.
INST.F.METEOROLOGIE
DIETRICH-SCHAFERWEG 6-10
1000 BERLIN 41
FEDERAL REPUBLIC OF GERMANY:

PFEILSTICKER,K.
MAX-PLANCK-INSTITUTE
D 69 HEIDELBERG
FEDERAL REPUBLIC OF GERMANY:

PUCHER,R.
STILLEWEG 2
D 3000 HANNOVER 51
FEDERAL REPUBLIC OF GERMANY:

RICHTER,A.
MAX-PLANCK-INSTITUT F.AERONOMIE
POSTFACH 20
D-3411 KATLENBURG-LINDAU
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POSTFACH 20
D 3411 KATLENBURG LINDAU 3
FEDERAL REPUBLIC OF GERMANY:

ROESER,H.A.
STILLWEG 2
D-3000 HANNOVER 51
FEDERAL REPUBLIC OF GERMANY:

ROSE,K.
FREIE UNIVERSITAT
DIETRICH-SCHAFER-WEG G-10
D-1000 BERLIN 41
FEDERAL REPUBLIC OF GERMANY:

ROSENBAUER,H.
MAX PLANCK INST. F. AERONOMIE
D-3411 KATLENBURG-LINDAU 3
FEDERAL REPUBLIC OF GERMANY:

RUSTER,R.
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POSTFACH 20
3411 KATLENBURG-LINDAU 3
FEDERAL REPUBLIC OF GERMANY:

SCHLAGER,H.
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3411 KATLENBURG-LINDAU 3
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SCHMAILZL,U.
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SAARSTR.23, PF 3060
6500 MAINZ
FEDERAL REPUBLIC OF GERMANY:

SCHMIDT,G.
MAX-PLANCK-INST. F. AERONOMIE
POSTFACH 20
3411 KATLENBURG-LINDAU 3
FEDERAL REPUBLIC OF GERMANY:

SCHMIDT,U.
KFA JULICH GMBFF JCH 3
POSTFACH 1913
D 5170 JULICH
FEDERAL REPUBLIC OF GERMANY:

SCHMUCKER,U.
PLANCKSTR. 19
D-3400 GOTTINGEN
FEDERAL REPUBLIC OF GERMANY:

SCHOLER,M.
MPI F. EXTRATERR. PHYSIK
D8046 GARCHING
FEDERAL REPUBLIC OF GERMANY:

SCHOLL,M.
INST.F.GEOPHYS.WISSENSCHAFTEN
FREIE UNIV.THIELALLEE 50
1000 BERLIN 33
FEDERAL REPUBLIC OF GERMANY:

SCHRODER,W.
HECHELSTR. 8
D 2820 BREMEN-RONNEBECK
FEDERAL REPUBLIC OF GERMANY:

SCHURR,K.
INST.F.ANGEW.GEOPHYSIK
THERESIENSTR. 41
D-8000 MUNCHEN 2
FEDERAL REPUBLIC OF GERMANY:

SCHWABBAUER,P.
DEPT. OF PHYS., UNIV. OF WUPPERTAL
GAUSS STR. 20
D 5600 WUPPERTAL 1
FEDERAL REPUBLIC OF GERMANY:

SCHWARZ,G.
INST.F.GEPHYS.WISS.
FREIE UNIV. RHEINBABENALLEE 49
D 1000 BERLIN 33
FEDERAL REPUBLIC OF GERMANY:

SIEBERT,M.
INST.F.GEOPHYS.UNIV.GOTTINGEN
HERZBERGER LANDSTR. 180
D-3400 GOTTINGEN
FEDERAL REPUBLIC OF GERMANY:

SOFFEL,H.C.
INST.F.ANGEW. GEOPHYS.
THERESIENSTR.41
D-8000 MUNCHEN 2
FEDERAL REPUBLIC OF GERMANY:

SPITTA,P.
INSTITUT F. GEOPHYSIK
HERZBERGER LANDSTRASSE 180
D-3400 GOTTINGEN
FEDERAL REPUBLIC OF GERMANY:

STIX,M.
KIEPENHEUER-INST.
SCHONECKSTR. 6
D-7800 FREIBURG
FEDERAL REPUBLIC OF GERMANY:

TANSKANEN,P.J.
MAX-PLANCK-INST. F. AERONOMIE
POSTFACH 20
D 3411 KATLENBURG-LINDAU
FEDERAL REPUBLIC OF GERMANY:

TEZKAN,B.
INSTITUT F. GEOPHYSIK
HERZBERGER LANDSTR.180
D-3400 GOTTINGEN
FEDERAL REPUBLIC OF GERMANY:

THIEMANN,H.
PHYS.TECHN.STUDIEN GMBH
LEINENWEBERSTR.16
7800 FREIBURG
FEDERAL REPUBLIC OF GERMANY:

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8580 BAYREUTH
FEDERAL REPUBLIC OF GERMANY:

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CORRENSTR. 24
D-4400 MUNSTER
FEDERAL REPUBLIC OF GERMANY:

VASYLIUNAS,V.M.
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3411 KALTENBURG-LINDAU
FEDERAL REPUBLIC OF GERMANY:

VOLKER,R.
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RHEIBABEN ALLEE 49
1 BERLIN 33
FEDERAL REPUBLIC OF GERMANY:

VOLLAND,H.
RADIOASTRONOMISCHES INST.
UNI. BONN,AUF DEM HUGEL 71
53 BONN 1
FEDERAL REPUBLIC OF GERMANY:

VON ZAHN
FEDERAL REPUBLIC OF GERMANY:

WEDEKEN,U.
INST. F. GEOPHYSIK
HERZBERGER LANDSTR. 180
D 3400 GOTTINGEN
FEDERAL REPUBLIC OF GERMANY:

WEIDELT,P.
INST.F.GEOPHYS.&METEOROLOGIE
MENDELSDINSTR.3
D-3300 BRAUNSCHWEIG
FEDERAL REPUBLIC OF GERMANY:

WIENERT,K.
SENSERBERGSTR. 60
D-8080 FURSTENFELDBRUCK
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POSTFACH 20
D-3411 KATLENBURG-LINDAU
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HHI DER ADW,
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1525 BUDAPEST 114
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POB. 49
1525 BUDAPEST 114
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1525 BUDAPEST 114
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HUNGARY:

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HOMI BHABHA ROAD
BOMBAY 400005
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INDIAN EMBASSY
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CSSR:

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