

Dr. Greg Severn

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Education

- Ph.D. ('87) Physics, University of Wisconsin, Madison. Thesis in experimental plasma physics, *Experimental Studies of the Rotational Stability of the Phaedrus Tandem Mirror*
- M.S. ('82) Physics, University of Wisconsin, Madison.
- B.S. ('79) Physics, University of California, Los Angeles. Elected to $\Sigma\Pi\Sigma$, '79, National Physics Honor Society

Appointments

- Professor of Physics, University of San Diego, 1994 to present (selected Faculty Mentor of the Year, 2010, McNair Scholars program, and Professor of the Game, 24 Feb. 2011)
- Associate Professor of Physics, University of San Diego, 1991-1994
- Assistant Professor of Physics, University of San Diego, 1987-1991
- Dept. Chair, 2003-2016¹
- Honorary Research Fellow, College of Engineering, Dept. of Engineering Physics, University of Wisconsin-Madison, 2006-
- Visiting Professor of Engineering Physics, University of Wisconsin, Madison, 2001
- Visiting Research Scientist, University of California, San Diego, 1993-1994

Extramural Research Grants Awarded

1. US Department of Energy, DOE-DE-SC0014226 *Collaborative Research: Understanding Sheaths and Pre-Sheaths in Magnetized and Unmagnetized Plasmas*, PI Greg Severn, USD; collaborating with Noah Hershkowitz and Oliver Schmitz, UW-Madison. 2015-2018 \$ 165,000, a proposal to continue existing experiments along with new explorations in plasma boundary layer physics. USD Grant id: PHYS1211
2. National Science Foundation, PHY-1464838 *Collaborative Research: Understanding Sheaths and Pre-Sheaths in Magnetized and Unmagnetized Plasmas*, PI Greg Severn, USD; 2015-2018, \$ 15,000, a proposal to continue existing experiments along with new explorations in plasma boundary layer physics. The NSF piece of this funding is for undergraduate student research support.
3. National Science Foundation, S-STEM Grant for undergraduate scholarships, *Supporting Students for Success in Mathematics, Computer Science and Physics at the University of San Diego*, PI Perla Myers, along with Eric Jiang, Jane E. Friedman, Lukasz Pruski, Rae Anderson, and myself-\$ 609,811. Involved part of the grant writing, and will involve recruiting, mentoring students, 2015-2019.
4. National Science Foundation, PHY-1206421, *Collaborative Research: Ion Losses to Plasma Boundaries-Sheaths and Presheaths* 2012-2015 \$ 165,000; My third renewal! My work has been productive (3 peer reviewed publications this year, with one undergraduate attending my main research conference, along with one invited talk at another international research conference)
5. National Science Foundation, CBET-0903832, *Collaborative Research: Understanding of Presheaths and Sheaths in Plasmas*, 2009-2012 \$ 175,000;

¹w. sabbatical leaves in 07, 14-15; also from 2003-2006 I was an area coordinator

6. National Science Foundation, S-STEM Grant for undergraduate scholarships, DUE-0965940, *Attracting students to Computer Science, Mathematics and Physics at USD*, PI's Cameron Parker, Eric Page, Lukasz Pruski, Simon G. M. Koo, and Eric Jiang, along with Jane E. Friedman, and myself—\$ 597,774. Involved part of the grant writing, along with recruiting, mentoring students, 2010-2015.
7. US Department of Energy, DOE DE FG02-03ER54728, *Collaborative Understanding presheaths and sheaths in plasmas* 2006-2009 \$135,000;
8. National Science Foundation, CHE0321326, *MRI/RUI: Acquisition of Laser Instrumentation for Undergraduate Research and Teaching*, \$ 198,000, Co-PI with Dr. Jim Bolender (Chemistry), and Dr. Michel Boudrias (MARS).
9. US Department of Energy, DOE DE FG02-03ER54728, *Collaborative Understanding presheaths and sheaths in plasmas* 2003-2006, \$165,000
10. National Science Foundation, PHY-9722658, Research in Undergraduate Institutions (RUI), *Experimental Studies in Chaotic Dynamics and Transport in plasmas using Laser-Induced Fluorescence* 1997-2000, \$ 131,000; this was the first research grant in the Physics Department to bring indirect costs back to the University.
11. The Research Corporation, CC4358, *Experimental Studies of Chaotic Dynamics using LIF in plasmas* 1996-1998, \$ 29,285
12. National Science Foundation, USE9052344, Instrumentation and Laboratory Improvement Grant, 1990-1993 *Vacuum Apparatus for Study of Vacuum Technology and Plasma Physics*; this grant served to create the Physics Department's first upper division experimental physics course.

Synergistic Activities

- Teaching innovations: My background in (and enjoyment of!) diagnostic development led me to think of new ways diode lasers could be used to try old experiments. One of my undergraduate research students and I worked on a project involving Ruchardt's method for measuring the ratio of specific heats of air. Our paper was published in the American Journal of Physics. Presently, our funded work has led to the inclusion of new experiments in our upper division experimental physics course (PHYSICS 480W, Experimental Modern Physics), one of which was an ion acoustic waves experiment in a two ion species plasma. Undergraduates get the feel of doing experiments at current forefront of research in plasma physics. I have submitted a paper about the physics of the plasma sheath to the American Journal of Physics, and in this way I have reached the general physics teaching community with news of research in plasma physics, an underrepresented subject in that important journal for physics teachers. Member American Association of Physics Teachers, 1987-2002, 2006-
- Creation of Research tools: I participated in the work of searching for LIF schemes in ArII suitable accessible by diode lasers. I collaborated with Roger McWilliams group at UCI and helped field the first diode laser based LIF instrument for use in plasma physics. I wrote the paper describing our work in the Reviews of Scientific Instruments. Our work has been influential in the plasma physics community; many researchers now use diode laser based LIF and many cite our paper. Member American Physical Society. I have been sought out as a consultant on the implementation of diode laser systems by research groups at West Virginia University, University of Wisconsin-Madison, and KAIST, Daejeong, Republic of Korea.
- Service to science and engineering communities: I have served on the executive committee of the American Physical Society's Gaseous Electronics Conference, 2012-2014. I have participated in local and national AAPT conferences, in presenting posters, giving talks and also as a local organizer, most recently AAPT winter meeting 2015 San Diego. I am a referee or reviewer for the following peer reviewed journals, and publishing houses:

1. Physics of Plasmas², the main archival journal for the discipline of plasma physics in the United States.
2. Reviews of Scientific Instruments,
3. Journal of Applied Physics,
4. American Journal of Physics³
5. Journal of Physics D: Applied Physics ⁴
6. Journal of Fusion Energy
7. Plasma Sources, Science and Technology⁵
8. Canadian Journal of Physics
9. IEEE Transactions on Plasma Science,
10. National Science Foundation (MRI Grant reviewer, Plasma Physics Grant reviewer)
11. U.S. Dept. of Energy; I recently served on a panel for low temperature plasma proposals—I was the only reviewer from a principally undergraduate institution, and earlier was a reviewer for Fusion energy research proposals
12. Thomson, Brooks-Cole; I have served as a reviewer (chapter reviewer for 3rd Ed. and chapter reviewer and final copy reviewer for 4th Ed.) for *Principles of Physics*, Serway & Jewett, one of the most popular texts in the U.S. for courses like our General Physics courses, and a text which USD has adopted since I began reviewing for the them.

Peer Reviewed Physics Journal Publications

1. *Experimental studies of ion flow near the sheath edge in multiple ion species plasma including Argon, Xenon, and Neon* by Severn, Greg; Yip, Chi-Shung; Hershkowitz, Noah; Baalrud, Scott D, submitted to Plasma Sources Sci. Technol. on 28 Dec. 2016, still in review, hope that it's accepted soon, this is the substance of my invited talk in Germany, 69th GEC conference in October 2016
2. *Ion velocity-locking in the neighborhood of virtual cathodes via instability enhanced collisional friction* Chi-Shung Yip, Noah Hershkowitz, and Greg Severn, Plasma Sources Sci. Technol. **26** 015008, (2017).
3. *Laser-induced fluorescence measurements of argon and xenon ion velocities near the sheath boundary in 3 ion species plasmas* Chi-Shung Yip, Noah Hershkowitz, Greg Severn and Scott D. Baalrud Phys. Plasmas **23**, 050703 (2016)
4. *Free Falling Magnetic Dipole in a Superconducting Tube.*, Tim Welsh ('14) and Greg Severn, submitted (4 May 2015) and in review, The Physics Teacher.
5. *Comment on The use of dc glow discharges as undergraduate education tools*, Chi-Shung Yip and Greg Severn, Am. J. Phys. **83**, 654 (2015).
6. *Verifying effects of instability enhanced ion-ion Coulomb collisions on ion velocity distribution functions near the sheath edge in low temperature plasmas*, Chi-Shung Yip, Noah Hershkowitz, and Greg Severn, Plasma Sources Sci. Technol. **24** 015018, (2015).
7. *Measurements of the ion Drift Velocities in the Presheaths of Plasmas with Multiple ion Species*, Severn, G., Yip, C.-S., Hershkowitz, N.; Journal of Instrumentation, **8** C11020 (2013).
8. *A note on the gyromagnetic properties of the hydrogens*, G.D. Severn, and J.P., Bolender, AMERICAN JOURNAL OF PHYSICS **81** 873-874 (2013).
9. *Mackenzie's Demon with Instabilities*, Chi-Shung Yip, Sheehan, J.P., Hershkowitz, N., and Severn, G.; Plasma Sources Science and Technology, **22**, 065002, (2013);
10. *Comment on "Ar + and Xe + Velocities near the Presheath-Sheath Boundary in an Ar/Xe Discharge"*, Hershkowitz, N., Severn, G.D., Baalrud, S.D., Hegna, C.C., Callen, J.D., Physical Review Letters **108**, 139501 (2012).

²Published by the American Institute of Physics (AIP), College Park MD, 20740-3845

³Published by the American Association of Physics Teachers, member society of AIP, College Park, MD 20740-3845

⁴Published by the Institute of Physics, Bristol, England

⁵Published by the Institute of Physics, Bristol, England

11. *Experimental test of instability enhanced collisional friction for determining ion loss in two ion species plasmas*, N. Hershkowitz, C.-S. Yip, and G. D. Severn, Phys. Plasmas **18**, 057102 (2011).
12. *Experimental Test of Instability-Enhanced Collisional Friction for Determining Ion Loss in Two Ion Species Plasmas*, C.-S. Yip, Noah Hershkowitz, and Greg Severn, Phys. Rev. Lett. **104**, 225003 (2010)
13. *Experimental studies of transverse metastable ion velocity distribution functions in the presheath of a weakly collisional argon plasma*, Dongsoo Lee, Noah Hershkowitz, and Greg Severn, Phys. Plasmas **15**, 083503 (2008)
14. *Xenon ion laser-induced fluorescence using a visible tunable diode laser near 680nm*, Greg Severn, Dongsoo Lee, and Noah Hershkowitz, Review of Scientific Instruments, **78** 116105 NOV (2007)
15. *Measurements of Ar⁺ and Xe⁺ velocities near the sheath boundary of Ar-Xe plasma using two diode lasers*, Dongsoo Lee, Noah Hershkowitz, and Greg Severn, Applied Physics Letters, v 91, n 4, p 041505, 2007.
16. *A note on the plasma sheath and the Bohm Criterion*, G.D. Severn, Am. J. Phys. **75**, 92 (2007)
17. *Laser-induced fluorescence measurements of argon ion velocities near the sheath boundary of an argon-xenon plasma*, Dongsoo Lee, G.D. Severn, L. Oksuz, and Noah Hershkowitz, Journal of Physics D: Applied Physics, v 39, n 24, Dec 21, p 5230-5235, 2006
18. *Ion flow and sheath physics studies in multiple ion species plasmas using diode laser based laser-induced fluorescence*, G. D. Severn, Xu Wang, N. Hershkowitz, M. Turner, R. McWilliams, Solid Thin Films, **506,507**, p.674-678, 2004
19. *Experimental studies of the Bohm Criterion in a two ion species plasma using laser induced fluorescence*, G.D. Severn, Xu Wang, Eunsuk Ko, and N.Hershkowitz, Physical Review Letters, April 11, volume 90, No.14 (145000), 2003
20. *A simple extension of Ruchardt's method for measuring the ratio of specific heats of air using microcomputer based laboratory sensors*, G.D. Severn and T. Steffensen⁶, American Journal of Physics, **69**, 387, (2001)
21. *Argon ion laser-induced fluorescence with diode lasers*, G.D. Severn, D.A. Edrich, and R. McWilliams, Rev. Sci. Instrum. **69** 10 (1998)
22. *Radial control of the electrostatic potential in a tandem mirror with quadrupole end cells*, G.D. Severn, N. Hershkowitz, Phys. Fluids B, **4**, 3210 (1992)
23. *Experimental studies of the rotational stability of a tandem mirror with quadrupole end cells*, G.D. Severn, N. Hershkowitz, R.A. Breun, and J.R. Ferron, Phys. Fluids B, **3**, 114 (1991)
24. *Electrostatic End Plugging Accompanied by a Central-Cell Density Increase in an Axisymmetric Tandem Mirror*, J.R. Ferron, R. Goulding, B.A. Nelson, T. Intrator, En Yao Wang, G. Severn, N. Hershkowitz, D. Brouchous, J. Pew, R.A. Breun, R. Majeski, Phys. Fluids **30**, 2855 (1987)
25. *Application of Secondary Emission-Capacitive Probes for plasma potential measurements in plasmas with hot electrons* En Yao Wang, N. Hershkowitz, D. Diebold, T. Intrator, R. Majeski, H. Persing, G. Severn, and B. Nelson, J. Appl. Phys. **61**, 4786 (1987)
26. *Stabilization of MHD modes in an axisymmetric magnetic mirror by applied RF waves and initial results of Phaedrus-B*, Breun, R.A. (Dept. of Nucl. Eng., Wisconsin Univ., Madison, WI, USA), Brooker, P.; Brouchous, D., Browning, J., Butz, G., Conrad, J., Dales, E., Ferron, J., Goulding, R., Hershkowitz, N., Intrator, T., Litwin, C., Majeski, R., Meassick, S., Nelson, B., Peranich, L., Persing, H., Radtke, J., Roberts, D., Severn, G., Sing, D., Wang, E., D'Ippolito, D.A., Myra, J.R., Francis, G.L., Nuclear Fusion Supplement, v 2, p 263-71, (1987)

Invited Talks

1. *Are the things you read in theory papers that have not been experimentally validated true?*, Greg Severn, University of San Diego, and Noah Hershkowitz, University of Wisconsin-Madison, 20th Anniversary NSF/DOE Plasma Partnership Workshop, NSF , Arlington VA, 9-11 January 2017
2. *First experimental studies of ion flow in 3 ion species plasmas at the presheath-sheath transition*, Greg Severn, 69th Annual Gaseous Electronics Conference, October 1014, 2016; Bochum, Germany
3. *First laser-induced fluorescence measurements of argon and xenon ion velocities near the sheath boundary in 3 ion species plasmas*, 18th International Congress on Plasma Physics (ICPP), Kaohsiung, Taiwan, June29,2016
4. *First experimental studies of ion flow in 3 ion species plasmas at the presheath-sheath transition*, Plasma Physics Seminary, July 1, 2016 Hanyang University Seoul, KOREA

⁶undergraduate student author

5. *How might Quantum Physics inform our Faith?*, All Soul's Episcopal Church, Point Loma, CA, 22 November, 2015
6. *Langmuir's Paradox and ion dynamics: can the ion acoustic instability thermalize ions at the plasma sheath edge?— how Batman may be involved :)*, Greg Severn, Plasma Physics Seminar, University of Iowa, Department of Physics, Iowa City, IA, 23 March, 2015
7. *Assumptions vs. experimental answers in 2 realistic plasma boundary experiments: # 1-Bohm velocities in multi-ion species plasmas, and # 2 ion dynamics in magnetic presheaths*, Greg Severn and Noah Hershkowitz, Northrop Grumman Workshop on Basic Plasma Science, Northrop Grumman, Los Angeles, CA, 23 April 2015
8. *LIF studies of Discharge Plasma Sheaths*, Greg Severn, 45th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics; Monday-Friday, June 26, 2014; Madison, Wisconsin
9. *Measurements of the ion Drift Velocities in the Presheaths of Plasmas with Multiple ion Species*, Greg Severn, 16th International Symposium on Laser Aided Plasma Diagnostics, Madison WI, 22-26 September 2013
10. *John Henry Newman, a new star rising in the west*, Graduate Christian Fellowship, UCSD, Jan.4, 2011
11. *Plasma physics from fusion to plasma processing: cool ideas in the physics of hot stuff*, Spring meeting of the Southern California American Association of Physics Teachers Meeting, Nov.14 2009
12. *An experimental study of what happens to ions at the plasma boundary in multiple-ion species plasmas: how diode lasers help illumine the problem of sheath formation*, Plasma Physics Seminar (Plasma Theory and Simulation Group), University of California, Berkeley, 22 June, 2009.
13. *What happens to ions at the plasma boundary in multiple-ion species plasmas? How diode lasers help illumine the problem of sheath formation*, Plasma Physics Seminar at UC Irvine, 27 May 2009
14. *The Quantum Mechanics of Belief, being a consideration of 4 Models of relating Science to Faith*, Graduate Christian Fellowship, UCSD, Nov. 20, 2008
15. *Is the Bohm Criterion satisfied in multiple ion species plasmas? Adventures with fluorescence (LIF) and Extremum Principles*, National Center for Plasma Science and Technology, Dublin City University, Dublin, Ireland, Jan.18, 2008
16. *Experiments in Science and Faith: to what extent are scientific experiments possible in the realm of Faith, and does Scripture furnish examples either by precept or described experience?* Graduate Christian Fellowship, UCSD, Oct. 18, 2007
17. *Is the Bohm Criterion satisfied in multiple ion species plasmas? Adventures with laser-induced fluorescence (LIF)*, Plasma Physics Seminar, University of Colorado, Boulder, Center for Integrated Plasma Studies, Oct. 1, 2007
18. *How to integrate Academic Life with (respect to) "deefaith"*, Graduate Christian Fellowship, UCSD, September 28, 2006
19. *Being the right kind of Fool*, Graduate Christian Fellowship, UCSD, March 16, 2006
20. *Diode Lasers for Ion Flow and Sheath Physics Studies in Multiple Ion Species Plasmas*, 7th APCPST (Asian Pacific Conference on Plasma Science and Technology) and 17th SPSM (Symposium on Plasma Science for Materials), Fukuoka International Congress Center, Japan, June 29- July 2, 2004
21. *Science & Faith and the search for certainty: ideas from the sermons of John Henry Newman*, Greg Severn, Intersarsity Christian Fellowship of the University of Wisconsin, Madison, September 21 2001
22. *How fast do ions fall into the sheath in a multiple ion species plasma? A progress report.*, Center for Plasma Aided Manufacturing, Fall 2001 Seminar Series, University of Wisconsin-Madison, Madison, WI, 21 September, 2001
23. *Diode lasers for laser-induced fluorescence diagnosis of distribution functions and transport coefficients in ArII plasmas, relevant for sheath physics problems of interest to the plasma processing industry and for fundamental physics problems of interest to all physical scientists everywhere.* Center for Plasma Aided Manufacturing, Spring 2001 Seminar Series, University of Wisconsin-Madison, Madison, WI, 2 February, 2001
24. *Diode lasers for laser-induced fluorescence in ArII plasmas and the search for connections between chaos and diffusion*, Physics Seminar, 25 Sept. 2000, Dept. of Physics, San Diego State University
25. *Argon ion laser induced fluorescence with Diode Lasers*, Engineering Research Center for Plasma-Aided Manufacturing, Winter Seminar Series, Jan. 23, 1998
26. *Contact: Boundaries between Physics and Faith*, Dr. Greg Severn, Faith and Science Series, Sponsored by University Ministry, University of San Diego, March 24, 1998
27. *Science & Faith*, Dr. Jack Crumley, Dr. Greg Severn, Passport to Success Program, Sponsored by University Ministry, University of San Diego, Oct. 20, 1998

Conference Papers

1. *Ion transport and entrapment in electrostatic virtual cathodes*, Chi-Shung Yip, Noah Hershkowitz, University of Wisconsin Madison, and Greg Severn, University of San Diego, 58th Annual Meeting of the APS Division of Plasma Physics, October 31-November 4 2016; San Jose, California
2. *Ion loss in weakly collisional three ion species plasmas*, Chi-Shung Yip, Noah Hershkowitz, University of Wisconsin Madison, and Greg Severn, University of San Diego, 58th Annual Meeting of the APS Division of Plasma Physics, October 31-November 4 2016; San Jose, California
3. *Upgrades to the MARIA Helicon Experiment at UW-Madison*, Jonathan Green, Noah Hershkowitz, Victoria Winters, and Oliver Schmitz, University of Wisconsin Madison, and Greg Severn, University of San Diego, 58th Annual Meeting of the APS Division of Plasma Physics, October 31-November 4 2016; San Jose, California
4. *"MEASUREMENT OF AXIAL ION FLOW PROFILES IN A LINEAR HELICON PLASMA WITHOUT EXPLICIT DE-CONVOLUTION OF THE MEASURED LINE SHAPES"* J. Green, O. Schmitz, V. Winters, University of Wisconsin - Madison, Department of Engineering Physics, Madison, WI, USA, G. Severn, University of San Diego, Department of Physics and Biophysics, San Diego, CA, USA, 19th International Conference on Atomic Processes in Plasmas, (APiP) Paris, April 2016
5. *BP12.00058 : The MARIA Helicon Plasma Experiment at UW Madison: Upgrade, Initial Scientific Goals Mission and First Results*, Victoria Winters, Jonathan Green, Noah Hershkowitz, and Oliver Schmitz, University of Wisconsin Madison, Greg Severn, University of San Diego, 57th Annual Meeting of the APS Division of Plasma Physics, November 16-20, 2015; Savannah, Georgia
6. *GT1.00037 : Is the Bohm Criterion satisfied in magnetized plasmas, and how does ion-neutral collisionality matter?* Greg Severn, Dept. of Physics, University of San Diego, Jonathan Green, Victoria Winters, Chi-Shung Yip, Noah Hershkowitz, Oliver Schmitz, Dept. of Engineering Physics, University of Wisconsin-Madison) 68th Annual Gaseous Electronics Conference/9th International Conference on Reactive Plasmas/33rd Symposium on Plasma Processing, October 12-16, 2015; Honolulu, Hawaii
7. *NR3.00006 : Virtual Cathodes near small electrodes biased near the plasma potential and its effects on Langmuir probes*, Chi-Shung Yip, Noah Hershkowitz, Dept. of Engineering Physics, University of Wisconsin-Madison, Greg Severn, Dept. of Physics, University of San Diego, 68th Annual Gaseous Electronics Conference/9th International Conference on Reactive Plasmas/33rd Symposium on Plasma Processing, October 12-16, 2015; Honolulu, Hawaii
8. *Investigation of possible sheath disappearance near a electrode biased at the plasma potential* PO7.00006: oral, Chi-Shung Yip, Noah Hershkowitz, and Severn, Greg, 56th Annual Meeting of the APS Division of Plasma Physics, October 27-31, 2014; New Orleans, Louisiana
9. *Does the Bohm Criterion have meaning for collisional plasmas?* GT1.00015: Poster, Severn, Greg, Chi-Shung Yip, Noah Hershkowitz, 67th Annual Gaseous Electronics Conference. November 27, 2014; Raleigh, North Carolina
10. *Investigation of possible sheath disappearance near a electrode biased at the plasma potential* Chi-Shung Yip, Hershkowitz, N., and Severn, G. IEEE 41st International Conference on Plasma Sciences (ICOPS) Location: Washington, DC, USA Date: 25-29 May 2014
11. *Kr ion Laser-Induced Fluorescence using a tunable diode laser near 729nm for Sheath experiments, HW1.00040: Poster*, Greg Severn and Chris Yip('14)⁷, Noah Hershkowitz, 66th Annual Gaseous Electronics Conference, 30 October 4 2013; Princeton, New Jersey
12. *The Langmuir Paradox: Can the Ion Acoustic Instability at the Sheath Edge Thermalize the Ions Too?* NR#.00004; C.-S. Yip, N. Hershkowitz, G. Severn, 66th Annual Gaseous Electronics Conference, 30 October 4 2013; Princeton, New Jersey
13. *The Langmuir Paradox: Can the Ion Acoustic Instability at the Sheath Edge Thermalize the Ions Too?*, 6B-5; C.-S. Yip, N. Hershkowitz, G. Severn, 40th Annual International Conference on Plasma Science, June 16-21, San Francisco, CA
14. *The Maxwell Demon and its instabilities, LW2.00002 poster*, Chi-Shung Yip, J.P. Sheehan, Umair Suddiqui, Noah Hershkowitz, Greg Severn, 65th Annual Gaseous Electronics Conference, October 22-26, 2012; Austin, Texas

⁷undergraduate student author

15. *Experimental Studies of Laser-Induced Fluorescence of Kr⁺*, NW1.00065, Greg Severn, Tim Welsh('14)⁸, Noah Hershkowitz, 65th Annual Gaseous Electronics Conference, October 22-26, 2012; Austin, Texas
16. *What's missing from the traditional explanation of NMR experiments?* Greg Severn, Jim Bolender, ALPhA (Advanced Laboratory Physics Association) 2012 Topical Conference on Laboratory Instruction: Beyond the First Year (BFY), University of Pennsylvania and Drexel University, July 25-27, 2012
17. *Will a magnet fall freely in a superconducting tube?*, Greg Severn, Tim Welsh (USD '14)⁹, ALPhA (Advanced Laboratory Physics Association) 2012 Topical Conference on Laboratory Instruction: Beyond the First Year (BFY), University of Pennsylvania and Drexel University, July 25-27, 2012
18. *The Langmuir Paradox: can the ion acoustic instability at the sheath edge thermalize the ions too?* AM1.00009–oral presentation, Hershkowitz, N.; Chi-Shung Yip; Severn, G.D., 64th Annual Gaseous Electronics Conference November 14-18, 2011; Salt Lake City, Utah
19. *Kr ion Laser-Induced Fluorescence using a tunable diode laser near 729nm*, AM1.00021–oral presentation, Severn, G.D., Welsh, T.(USD, '14)¹⁰, 64th Annual Gaseous Electronics Conference November 14-18, 2011; Salt Lake City, Utah
20. *Kr ion Laser-Induced Fluorescence using a tunable diode laser near 729nm*, FTP1.00095–poster presentation, Severn, G.D., Welsh, T.(USD, '14)¹¹, 64th Annual Gaseous Electronics Conference
21. *Experimental Test of Instability Enhanced Collisional Friction for Determining Ion Loss in Two Ion Species Plasmas*, Greg Severn, Chi-Shung Yip, and Noah Hershkowitz, 7th ICRP and 63rd GEC, October 4-8, 2010, Paris, France
22. *Experimental test of the role of ion-ion instability in determining ion loss from a two-species plasma* Hershkowitz, N. (Univ. of Wisconsin-Madison, Madison, WI, United States); Chi-Shung Yip; Severn, G.D. Source: 2010 IEEE 37th International Conference on Plasma Sciences (ICOPS 2010)
23. *Measurement of stream instability of argon-xenon plasma* Hershkowitz, N. (Univ. of Wisconsin - Madison, Madison, WI, United States); Chi-Shung Yip; Severn, G.D. Source: 2010 IEEE 37th International Conference on Plasma Sciences (ICOPS 2010), p 1 pp., 2010
24. *JO6.00005 : Experimental test of Baabrud's model for ion velocity at the sheath edge for a two ion species plasma* Noah Hershkowitz, Chi-Shung Yip, Greg Severn, 51st Annual Meeting of the APS Division of Plasma Physics, November 26, 2009; Atlanta, Georgia
25. *JP8.00053 : An experimental study of ion acoustic waves (IAW) in electronegative plasmas: can IAW measurements calibrate diagnostics for the measure of the negative ion fraction?*, Camron Proctor, Greg Severn, 51st Annual Meeting of the APS Division of Plasma Physics, November 26, 2009; Atlanta, Georgia
26. *NP6.016: The role of presheaths in establishing anisotropy at the sheath edge*, Noah Hershkowitz, Dongsoo Lee, Greg Severn, American Physical Society, 50th Annual Meeting of the Division of Plasma Physics, November 17-21, 2008
27. *VF3.00003 : Experimental studies of transverse metastable ion velocity distribution functions in the presheath of a weakly collisional argon plasma*, Greg Severn, Dongsoo Lee, and Noah Hershkowitz, American Physical Society, 61st Annual Gaseous Electronics Conference, October 13-17, 2008
28. *VF3.002: Presheaths are a useful concept; their role in establishing anisotropy at the sheath edge*, Noah Hershkowitz, Greg Severn, American Physical Society, 61st Annual Gaseous Electronics Conference, October 13-17, 2008
29. *FTP1.00021 : Xenon ion Laser-Induced Fluorescence using a tunable diode laser near 680nm*, Greg Severn (Dept. of Physics, University of San Diego), Dongsoo Lee, and Noah Hershkowitz (University of Wisconsin-Madison), 60th Gaseous Electronics Conference; Arlington, Virginia, Tuesday/Friday, October 25, 2007
30. *VF2.00006 First experimental test of the generalized Bohm criterion using Ar⁺ and Xe⁺ LIF in Ar-Xe plasmas*, Dongsoo Lee, Noah Hershkowitz (University of Wisconsin-Madison), and Greg Severn (Dept. of Physics, University of San Diego), 60th Gaseous Electronics Conference; Arlington, Virginia, Tuesday/Friday, October 25, 2007

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⁹undergraduate student author

¹⁰undergraduate student author

¹¹undergraduate student author

31. *2E3: LIF Measurements of Ar+ and Xe+ in Ar-Xe Plasmas near the Sheath Boundary with Tunable Diode Lasers* D. Lee, N. Hershkowitz (Dept. of Engineering Physics, University of Wisconsin-Madison, Madison, WI, USA), G. Severn (Dept. of Physics, University of San Diego, San Diego, CA, USA), IEEE International Conference on Plasma Science, 2007, Albuquerque NM, June 17-22, 2007
32. *JP1.00101 : How fast are ions lost from plasma with two ion species?* Noah Hershkowitz Dongsoo Lee, University of Wisconsin-Madison, Greg D. Severn, University of San Diego, Lutfi Oksuz, Suleyman Demirel Univ, Isparta, Turkey, 48th Annual Meeting of the Division of Plasma Physics, October 3, 2006; Philadelphia, Pennsylvania
33. *SRP2.00006 : LIF Measurement of Argon in Ar-Xe Plasma Sheath Boundary with Tunable Diode Laser*, Dongsoo Lee, Noah Hershkowitz, University of Wisconsin-Madison, G.D. Severn, University of San Diego, 2006 59th Annual Gaseous Electronics Conference, Oct. 12, 2006, Ohio State University, Columbus, OH.
34. *SRP2.00002 A new scheme for laser-induced fluorescence measurements in Xe II plasmas*, G.D. Severn, University of San Diego, Dongsoo Lee, Noah Hershkowitz, University of Wisconsin-Madison, 2006 59th Annual Gaseous Electronics Conference, Oct. 12, 2006, Ohio State University, Columbus, OH.
35. *Studies of sheath physics in two ion species plasmas with diode laser LIF*, Greg Severn (University of San Diego), Noah Hershkowitz (University of Wisconsin-Madison), M.M. Turner (Dublin City University, Dublin Ireland), 58th Gaseous Electronics Conference SundayThursday, October 17, 2005; San Jose, California
36. *Asymmetry reversal of ion collection by Mach probe in flowing unmagnetized plasma*, Eunsuk Ko, Xu Wang, Noah Hershkowitz (Dept. of Engineering Physics, University of Wisconsin - Madison), Gregory Severn (Dept. of Physics, University of San Diego), 58th Gaseous Electronics Conference Thursday, October 17, 2005; San Jose, California
37. *Diode lasers for ion flow and sheath physics studies in multiple ion species plasmas* Greg Severn (University of San Diego), Xu Wang, Eunsuk Ko, Noah Hershkowitz (University of Wisconsin-Madison), Miles Turner (Dublin City University), USD-UW Collaboration, USD-UW-DCU Collaboration, 57th Gaseous Electronics Conference, Shannon, The Republic of Ireland, September 26-29, 2004
38. *Measurement of Ion velocity by Mach probes in flowing unmagnetized plasmas*, E. Ko, X. Wang, N. Hershkowitz (Dept. of Engineering Physics, University of Wisconsin), G. Severn (Dept. of Physics, University of San Diego), 57th Gaseous Electronics Conference, Shannon, The Republic of Ireland, September 26-29, 2004
39. *Diode lasers for ion flow and sheath physics studies in multiple ion species plasmas* Greg Severn (University of San Diego), Xu Wang, Eunsuk Ko, Noah Hershkowitz (University of Wisconsin-Madison), Miles Turner (Dublin City University), USD-UW Collaboration, USD-UW-DCU Collaboration, 57th Gaseous Electronics Conference, Shannon, The Republic of Ireland, September 26-29, 2004
40. *on drift velocity measurement by Mach probes in unmagnetized plasmas*, Eunsuk Ko, Xu Wang, Noah Hershkowitz (Dept. of Engineering Physics, University of Wisconsin - Madison), Greg Severn (Dept. of Physics, University of San Diego), 46th Annual Meeting of the Division of Plasma Physics November 15-19, 2004 Savannah, GA
41. *(NWP 47) Ar ions fall out faster than 'Bohm' a multiple ion species plasma. Why?*, Greg Severn, Noah Hershkowitz, Xu Wang, Eunsuk Ko (Dept. of Engineering Physics, University of Wisconsin-Madison), UW-Madison Collaboration. 56th Gaseous Electronics Conference, San Francisco, California October 21-24, 2003
42. *FT1-1: Overview of our recent experiments and thoughts about plasma presheaths* Noah Hershkowitz, Eunsuk Ko, Xu Wang, (University of Wisconsin-Madison), Greg Severn (University of San Diego), 56th Gaseous Electronics Conference, San Francisco, California October 21-24, 2003
43. *How LIF has helped to understand ion loss at the boundaries of weakly collisional plasmas* Noah Hershkowitz, Eunsuk Ko, Xu Wang, L. Oksuz, A. Hala (Dept. of Engineering Physics and Center for Plasma-Aided Manufacturing University of Wisconsin-Madison), Greg Severn (University of San Diego), 45th Annual Meeting of the Division of Plasma Physics, Albuquerque, New Mexico, October 27-31, 2003
44. *LIF Measurements of the Bohm Criterion for two ion species plasmas*, G.D. Severn, USD, GEC02 Special Workshop on Plasma Sheaths. 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
45. *LIF measurements of the Bohm Criterion for two ion species*, Greg Severn, University of San Diego, Xu Wang, and Noah Hershkowitz, University of Wisconsin-Madison, Special Workshop on Plasma Sheaths, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 15 October 2002.

46. *How fast do ions fall into the sheath in a multiple ion species plasma?* Greg Severn, University of San Diego, Xu Wang, and Noah Hershkowitz, University of Wisconsin, Madison, Poster QWP.057, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
47. *The Measurement of Ion Drift Velocities in Presheath in Single and Two Ion Species Plasmas* , Xu Wang, Eunsuk Ko, and Noah Hershkowitz, University of Wisconsin, and Greg Severn, University of San Diego, QWP.056, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
48. *FT1.005: How fast do ions fall out of a weakly collisional two species plasma?* Noah Hershkowitz, Xu Wang, Eunsuk Ko (University of Wisconsin-Madison), Greg Severn (University of San Diego). Talk, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
49. *Ion Drift Velocities at Sheath/Presheath Boundary in Weakly Collisional Plasmas with Two Ion Species* Noah Hershkowitz, Eunsuk Ko, Xu Wang (Dept. of Engineering Physics and Center for Plasma-Aided Manufacturing University of Wisconsin-Madison), Greg Severn (University of San Diego). 44th Annual Meeting of the Division of Plasma Physics, November 11-15, 2002; Orlando, Florida
50. *Presheaths in weakly collisional plasmas with two ion species*, Noah Hershkowitz, Xu Wang, Eunsuk Ko (University of Wisconsin-Madison, USA), Greg Severn (University of San Diego, USA), Joint Conference ESCAMPIG 16. Sixteenth European Conference on Atomic and Molecular Physics of Ionized Gases. ICRP 5 Fifth International Conference on Reactive Plasma. Conference Proceedings, 2002, pt. 1, p 31-2 vol.1
51. *Presheaths in weakly collisional plasmas with two ion species*, Noah Hershkowitz, Xu Wang, Eunsuk Ko (University of Wisconsin-Madison), Greg Severn (University of San Diego). IEEE International Conference on Plasma Science, 2002, p 165
52. *Synthesis and Separation in Science & Faith: Ideas and Opinions of James Clerk Maxwell* , G.D. Severn, 57th annual conference of the ASA Pepperdine University, Aug 3, 2002
53. *How fast do ions fall into the sheath in a multiple ion species plasma?* , Greg Severn, Noah Hershkowitz, and Xu Wang, KP1.071, Proceedings of the 43rd Annual Meeting of the American Physical Society-DPP01, Oct. 31 2001, Long Beach CA.
54. *How fast do ions fall into the sheath in multiple ion species plasmas?* , Greg Severn, Noah Hershkowitz, and Xu Wang, Conference Proceedings of the 54th Gaseous Electronics Conference, GEC01, Penn State University, State College, PA, Oct. 12, 2001
55. *Does it make sense to talk about presheaths?* Noah Hershkowitz, Lutfi Oksuz, Greg Severn, Xu Wang, F1.004, Conference Proceedings of the 54th Gaseous Electronics Conference, GEC01, Penn State University, State College, PA, Oct. 12, 2001
56. *LIF Diagnostic Development for Diffusion Coefficient Measurements in Low Temperature ArII plasmas using Diode Lasers* , G.D. Severn, Conference Proceedings of the 28th IEEE International Conference on Plasma Science, Las Vegas, June 17-21, 2001
57. *Diagnostic Development of a Mach Probe and Laser-Induced Fluorescence Instrument for Diffusion Measurements in a Low Temperature Plasma.* J.A. Langton, J. Tallant¹², and G.D. Severn, American Association of Physics Teachers Winter Meeting, 10 January 2001.
58. *Diagnostic development of a diode laser based LIF instrument for velocity space diffusion measurements in quiescent and chaotic low temperature thermionic discharge plasmas* , G.D. Severn, Poster 3P27, 27th, IEEE International Conference on Plasma Science, New Orleans, LA, June 4-7, 2000.
59. *Experimental Studies of Nonlinear Dynamics and Diffusion in Low Temperature Plasmas* Tom Steffensen, Michael Leonard¹³, and Greg Severn, Poster RP01.132, Centennial Meeting of the American Physical Society, Atlanta Georgia, March 24, 1999
60. *Chaos in Couette Flow* , Greg Wong and¹⁴ Greg Severn, USD Undergraduate Research Conference, Spring 1998. I directed Greg's research work during his Physics 196 course. He reported on his work both in the poster session at the Undergraduate Research Seminar during the spring, but also in his Senior Seminar.
61. *Measuring the Ratio of Specific Heats, C_p/C_v* , Tom Steffensen and Greg Severn, USD Undergraduate Research Conference, Spring 1998. I have been developing a new laboratory physics experiment with Tom's help; he presented the data that he took at the research conference at USD, I presented my ideas at the joint APS/AAPT research conference, at we are working now on a manuscript for publication.

¹²undergraduate student authors; The truth is, only Mr. Langton gave the talk—Mr. Tallant was unable to attend the conference.

¹³undergraduate student authors

¹⁴undergraduate student author

62. *Ruchardt's Experiment Revisited: a new C_p/C_v Measurement* , G.D. Severn, Poster H24.11, Joint American Physical Society, American Association of Physics Teachers Meeting, Ohio, April 19th, 1998
63. *Experimental Studies of Diffusion and Lyapunov Exponents*, G. D. Severn, Poster pThpP1.10, 39th Annual Meeting of the American Physical Society, Nov. 7-12, 1997, Pittsburgh PA.
64. *Diode lasers for ion transport measurements* , G.D. Severn, D.A. Edrich, and R. McWilliams, 38th Annual American Physical Society, Division of Plasma Physics Meeting, Denver, CO, 11/12/96, Poster 4Q12
65. *Ion diffusion due to electrostatic turbulence* , G.D. Severn, D.A. Edrich, and R. McWilliams, 38th Annual American Physical Society, Division of Plasma Physics Meeting, Denver, CO, 11/12/96, Poster 4Q12
66. *Diode Lasers for Plasma Physics* , G.D. Severn, D.A. Edrich, and R. McWilliams, 43rd Annual Western Spectroscopy Association Conference, Monterey CA, Jan. 31, 1996, poster # 15
67. *Long Ion Confinement Times Using a 'Rotating Wall'* , F.A. Anderegg, X-Pei. Huang, C.F. Driscoll, G.D. Severn, and E. Sarid, Aip Conference Proceedings 331, Non-neutral Plasma Physics II, J. Fajans, D.H.E. Dubin, Eds., AIP Press, p.1, 1995
68. *Ion plasma diagnosed by LIF* , F. Anderegg, X.-P. Huang, E. Sarid, G.D. Severn, and C.F. Driscoll, American Institute of Physics Nonneutral Plasma Workshop, University of California, Berkeley, July 17, 1994
69. *In Situ LIF Measurements of a Pure Ion Plasma* , F. Anderegg, X.-P. Huang, G.D. Severn, and C.F. Driscoll, 36th Annual Meeting, American Physical Society Division of Plasma Physics, Minneapolis, Mn, Sept. 7-11, 1994
70. *Spin-up of Nonneutral Plasmas by Rotating Walls* , X.-P. Huang, F. Anderegg, R.E. Pollack, T.M. O'neil, G.D. Severn, and C.F. Driscoll, 36th Annual Meeting, American Physical Society Division of Plasma Physics, Minneapolis, Mn, Sept. 7-11, 1994
71. *Why Not Use Passive Sign Conventions for Elementary Electrical Circuit Theory?* AH6, American Association of Physics Teachers Announcer, **22**, 55 (1992)
72. *Plasma Physics and Vacuum Science for an Upper Division Undergraduate Experimental Physics Course* EF3, American Association of Physics Teachers Announcer, **22**, 85 (1992)
73. *Experimental results from Phaedrus-B* , Hershkowitz, N. (Dept. of Nucl. Eng. & Eng. Phys., Wisconsin Univ., Madison, WI, USA); Majeski, R.; Ferron, J.; Breun, R.; Brooker, P.; Brouchous, D.; Browning, J.; Diebold, D.; Goulding, R.; Intrator, T.; Keil, D.; Meassick, S.; Nelson, B.; Persing, H.; Probert, P.; Radtke, J.; Roberts, D.; Severn, G.; Wen, Y. Source: Physics of Mirrors, Reversed Field Pinches and Compact Tori. Proceedings of the Course and Workshop (EUR-11335-EN), p 855-71 vol.2, 1988
74. *Ponderomotive stability of MHD modes in mirrors* , Hershkowitz, N. (Dept. of Nucl. Eng. & Eng. Phys., Wisconsin Univ., Madison, WI, USA); Majeski, R.; Ferron, J.; Bruen, R.; Browning, J.; Chun, S.T.; Goulding, R.; Intrator, T.; Litwin, C.; Severn, G.; Meassick, S.; Yasaka, Y. Source: Physics of Mirrors, Reversed Field Pinches and Compact Tori. Proceedings of the Course and Workshop (EUR-11335-EN), p 751-69 vol.2, 1988
75. *Rotational Stability of the Axisymmetric Phaedrus Tandem Mirror Stabilized by RF Ponderomotive Force* , G.D. Severn, N. Hershkowitz, S.T. Chun, J. Pew, and J.R. Ferron, Bull. Am. Phys. Soc. **32**, 1781 (1987)
76. *The use of secondary emissive capacitive probes to determine plasma potential-a new diagnostic technique* , Hershkowitz, N. (Dept. of Nucl. Eng. & Eng. Phys., Wisconsin Univ., Madison, WI, USA); Wang, E.Y.; Diebold, D.; Intrator, T.; Majeski, R.; Persing, H.; Severn, G.; Nelson, B.; Wen, Y.J., IEEE Conference Record - Abstracts. 1987 IEEE International Conference on Plasma Science (Cat. No.87CH2451-3), p 73, 1987
77. *Experimental Studies of the Rotational Stability of the Phaedrus Tandem Mirror* , G.D. Severn, N. Hershkowitz, J. Pew, and J.R. Ferron, E.Y. Wang, S.T. Chun, Bull. Am. Phys. Soc. **31**, 1489 (1986)
78. *Stabilization of MHD Modes in an Axisymmetric Magnetic Mirror by Applied RF Waves and Initial Results of Phaedrus B* R.A. Breun, P.A. Brooker, J. Browning, D. Brouchous, G. Butz, J. Conrad, E. Dales, J. Ferron, R. Goulding, N. Hershkowitz, T. Intrator, C. Litwin, R. Majeski, S. Meassick, B. Nelson, L. Peranich, H. Persing, J. Radtke, D. Roberts, G. Severn, D. Sing, En Yao Wang, and D.A. D'Ippolito, J.R. Myra, and G.L. Francis, in the Proceedings of the Eleventh International Conference on Plasma Physics and controlled Nuclear Fusion Research (I.A.E.A., Kyoto, Japan, 1986)
79. *Ponderomotive Force and Rotational Effects on the Stability of Plasmas in a Tandem Mirror* , S.T. Chun, J.D. Callen, M.W. Phillips, G. Severn, Bull. Am. Phys. Soc. **31**, 1621 (1986)
80. *End plugging with central cell buildup in the Phaedrus axisymmetric tandem mirror* , J.R. Ferron, R. Goulding, B.A. Nelson, T. Intrator, En Yao Wang, G. Severn, N. Hershkowitz, D. Brochous, R.A. Breun, and R. Majeski , Bull. Am. Phys. Soc. **30**, 1490 (1985)

81. *Plasma potential and end loss measurements in the high density axisymmetric mode of the Phaedrus tandem mirror* , R. Goulding, J.R. Ferron, B.A. Nelson, T. Intrator, En Yao Wang, G. Severn, N. Hershkowitz, D. Bouchous, R.A. Breun, and R. Majeski, Bull. Am. Phys. Soc. **30**, 1490 (1985)
82. *Phaedrus Upgrade Facility* , R.A. Breun, P. Brooker, J. Browning, D. Bouchous, G. Butz, J. Conrad, J. Ferron, R. Goulding, N. Hershkowitz, T. Intrator, S. Meassick, R. Majeski, B. Nelson, P. Nonn, L. Peranich, H. Persing, J. Pew, G. Severn, and D. Sing, Bull. Am. Phys. Soc. **30**, 1492 (1985)
83. *Rotational Stability of the Phaedrus Tandem Mirror* , G. Severn, N. Hershkowitz, J. Pew, and J. Ferron, Bull. Am. Phys. Soc. **30**, 1490 (1985)
84. *Radial Potential Control in Phaedrus Using End Ring Bias* , G.D. Severn, N. Hershkowitz, B.A. Nelson, and J. Pew, Bull. Am. Phys. Soc. **29**, 1423 (1984)
85. *ICRF Potential Modification in a Tandem Mirror* , B.A. Nelson, N. Hershkowitz, G. Severn, and J. Pew, Bull. Am. Phys. Soc. **29**, 1423 (1984)
86. *Plasma Potential Control and MHD Stability Experiments in the Phaedrus Tandem Mirror* , N. Hershkowitz, R.A. Breun, D. Bouchous, J.D. Callen, C. Chan, J. Conrad, J. Ferron, S.N. Golovato, R. Goulding, S. Horne, S. Kidwell, B. Nelson, H. Persing, J. Pew, S. Ross, G. Severn, D. Sing, in the Proceedings of the Tenth International Conference on Plasma Physics and controlled Nuclear Fusion Research Vol. 2, p.265 (I.A.E.A., London, England, 1984)
87. *RF drift pumping designs for Phaedrus upgrade* , Breun, R.A. (Wisconsin Univ., Madison, WI, USA); Golovato, S.N.; Nonn, P.; Severn, G.; Siebert, K. Source: Conference Record of the 1984 IEEE International Conference on Plasma Science (papers in summary form only received) (Cat. No. 84CH1958-8), p 55, 1984
88. *Magnetic Field Mapping Experiments* , G.A. Butz, R.A. Breun, D. Bouchous, N. Hershkowitz, J. Pew, and G. Severn, Bull. Am. Phys. Soc. **29**, 1423 (1984)
89. *Radial Potential Modification Experiments in the Phaedrus Tandem Mirror Machine* , G. Severn, N. Hershkowitz, B.A. Nelson, and J. Pew, Bull. Am. Phys. Soc. **28**, 1202 (1983)
90. *Axial and Radial Plasma Potential Profiles in Tandem Mirror End Cells* , B. Nelson, C. Chan, N. Hershkowitz, J. Pew, and G. Severn, Bull. Am. Phys. Soc. **28**, 1203 (1983)
91. *Scaling of RF Sustained Tandem Mirror Parameters with Central Cell Heating Power including a Central Cell Stand Alone Mode* , J.R. Ferron, R.A. Breun, S.N. Golovato, R.H. Goulding, N. Hershkowitz, B. Nelson, and G. Severn, Bull. Am. Phys. Soc. **27**, 959 (1982) DOE DE FG02-03ER54728
92. *Measurements of Low Frequency Fluctuations in the Phaedrus Tandem Mirror* , R.A. Breun, J.R. Ferron, G. Severn, B. Nelson, and N. Hershkowitz, Bull. Am. Phys. Soc. **27**, 958 (1982)