

## **Dr. Stefan Gerhardt**

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### **Education:**

- Ph.D.: Electrical Engineering, U. of Wisconsin-Madison, 2004.
- M.S.: Electrical Engineering, U. of Wisconsin-Madison, 2001.
- B.S.: Interdisciplinary Degree in Applied Math, Engineering and Physics, U. of Wisconsin-Madison, 1998.

### **Awards:**

- Presidential Early Career Award in Science and Engineering (PECASE), 2009
- American Physical Society Marshall Rosenbluth Award for Outstanding Doctoral Dissertation in Plasma Physics, 2005.
- Harold Peterson Award: Outstanding Dissertation in the U. of Wisconsin Electrical Engineering Department, 2005.
- DOE/Oak Ridge Associated Universities Award to attend the 51<sup>st</sup> Meeting of Nobel Laureates in Lindau, Germany, 2001.
- Albert Augustus Radtke Scholarship, UW-Madison Physics Department, 1998.
- Phi Beta Kappa, U. of Wisconsin-Madison, 1997.
- National Undergraduate Fellowship Program in Plasma Physics and Fusion Energy Sciences, 1996.

### **Work Experience:**

- *Spring 2007-Present*: Staff Research Physicist, National Spherical Torus Experiment (NSTX)
- *Fall 2006-Fall 2007*: Staff Research Physicist, Magnetic Reconnection Experiment, Princeton Plasma Physics Laboratory (PPPL)
- *Summer 2004-Fall 2006*: Associate Research Physicist, Magnetic Reconnection Experiment, Princeton Plasma Physics Laboratory
- *Summer 1998-Spring 2004*: Graduate Student at Helically Symmetric eXperiment, Madison, U. of Wisconsin.
- *Fall 1996-Spring 1998*: Undergraduate Researcher, Madison Symmetric Torus, Madison, U. of Wisconsin.
- *Summer 1996*: Summer Student, Magnetic Reconnection Experiment, PPPL.
- *Fall 1995-Spring 1996*: Undergraduate Hourly, Madison Symmetric Torus, Madison, Wisconsin.

Referee for Physical Review Letters, Physics of Plasmas, Plasma Physics and Controlled Fusion, Review of Scientific Instruments, and Fusion Science & Technology.

### **Invited and Oral Presentations:**

1. *Measurements and modeling of electrode-induced plasma flows in HSX*, Joint US-European Transport Task Force Meeting, Madison, Wisconsin, 2003.
2. *Studies of Bias Induced Plasma Flows in HSX*, 14<sup>th</sup> International Stellarator Workshop, Greifswald, Germany, 2003.
3. *Measurements and Modeling of Electrode Biased Discharges in the HSX Stellarator*. Joint Meeting of US-Japan Workshop and Kyoto University 21<sup>st</sup> COE Symposium on "New Approaches in Plasma Confinement Experiments in Helical Systems", Kyoto, 2004.

4. *Progress and Plans for FRC Studies in MRX-FRC*, US-Japan Exchange 2004: New Directions and Physics for Compact Toroids, Santa Fe, New Mexico, 2004.
5. *Measurements and Modeling of Electrode Biased Discharges in the HSX Stellarator*, 20th IAEA Fusion Energy Conference, Vilamoura, Portugal, 2004.
6. *Measurements and Modeling of Plasma Flow Damping in the HSX Stellarator*, 46<sup>th</sup> Meeting of the Division of Plasma Physics, Savannah, Georgia, 2004.
7. *Reduced Neoclassical Flow Damping with Quasi-Symmetry: Measurements and Modeling from HSX*, 47<sup>th</sup> Meeting of the Division of Plasma Physics, Denver, Colorado, 2005.
8. *Equilibrium and Stability of Oblate Free-Boundary FRCs in MRX*, Innovative Confinement Concepts Conference, Austin, Texas, 2006
9. *Stability of Oblate Free-Boundary FRCs in MRX*, US/Japan Workshop on Compact Torus Plasmas, Swarthmore College, Philadelphia, Pennsylvania, 2007.
10. *Ohmic Sustainment of Free Boundary Compact Toroids in MRX*, Innovative Confinement Concepts Workshop, College Park, Maryland, 2007

Seminars presented at U. of Wisconsin, U. of Maryland, Columbia University, PPPL, and MIT.

**Peer Reviewed Journal Publications:**

1. B.E. Chapman, J.K. Anderson, T.M. Biewer, D.L. Brower, S. Castillo, P.K. Chattopadhyay, C.S. Chaing, D. Craig, D.J. Den Hartog, G. Fiksel, P.W. Fontanna, C.B. Forest, **S. P. Gerhardt**, A.K. Hansen, D. Holly, Y. Jiang, N.E. Lanier, S.C. Prager, J.C. Reardon, and J.S. Sarff, *Reduced edge instability and improved confinement in the MST reversed-field pinch*, Phys. Rev. Lett. **87**, 205001 (2001).
2. N.E. Lanier, **S.P. Gerhardt**, and D.J. Den Hartog, *Low-cost, robust, filtered spectrometer for absolute intensity measurements in the soft X-ray region*, Rev. Sci. Instrum. **72**, 1188 (2001).
3. D.T. Anderson, A.F. Almagri, F.S.B. Anderson, **S.P. Gerhardt**, J. Radder and J.N. Talmadge, *Initial experimental results from HSX*, J. Plasma and Fusion Research **78**, 209 (2002).
4. C. Deng, D.L. Brower, W.X. Ding, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, **S.P. Gerhardt**, P. Probert, and J.N. Talmadge, *First results from the Multichannel interferometer system on HSX*, Rev. Sci. Instrum. **74**, 1625 (2003).
5. K.M. Likin, A. Abdou, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, D. Brower, J. Canik, C. Deng, **S.P. Gerhardt**, W. Guttenfelder, S. Oh, J. Radder, V. Sakaguchi, J. Schmitt, J. Tabora, J.N. Talmadge, and K. Zhai, *Comparison of electron cyclotron heating results in the Helically Symmetric Experiment with and without quasi-symmetry*, Plasma Phys. Control Fusion **45**, A133 (2003).
6. J.N. Talmadge, K.M. Likin, A. Abdou, A. Almagri, D.T. Anderson, F.S.B. Anderson, J. Canik, C. Deng, **S.P. Gerhardt**, K. Zhai, *ASTRA modeling of electron cyclotron heating in HSX*, Fusion Science and Technology **46**, 255 (2004).
7. **S.P. Gerhardt**, D.T. Anderson, J.M. Canik, and L. Owen,  *$H_\alpha$  detector system for the Helically Symmetric Experiment*, Rev. Sci. Instrum. **75**, 2981 (2004).

8. **S. P. Gerhardt**, J.N. Talmadge, J.M. Canik, and D.T. Anderson, *Experimental evidence of reduced plasma flow damping with quasisymmetry*, Phys. Rev. Lett. **94**, 015002 (2005).
9. **S.P. Gerhardt**, D.T. Anderson, F.S.B. Anderson, and J.N. Talmadge, *Electrode and Langmuir probe tools used for flow damping studies in the Helically Symmetric Experiment*, Rev. Sci. Instrum. **75**, 4621 (2004).
10. **S.P. Gerhardt**, D.T. Anderson, and J.N. Talmadge, *Calculations of neoclassical viscous damping on flux surfaces near magnetic islands in the Helically Symmetric Experiment*, Phys. Plasmas **12**, 012504 (2005).
11. **S.P. Gerhardt**, J. N. Talmadge, J.M. Canik, and D.T. Anderson, *Measurements and modeling of plasma flow damping in the Helically Symmetric Experiment*, Phys. Plasmas **12**, 056116 (2005).
12. J.N. Talmadge, and **S.P. Gerhardt** *Numerical calculation of the Hamada basis vectors for three-dimensional toroidal magnetic configurations*, Phys. Plasmas **12**, 072513 (2005).
13. Y. Ren, M. Yamada, **S.P. Gerhardt**, H. Ji, R. Kulsrud, and A. Kuritsyn, *Experimental verification of the Hall effect during magnetic reconnection in a laboratory plasma*, Phys. Rev. Lett. **95**, 055003 (2005).
14. A. Kuritsyn, M. Yamada, **S.P. Gerhardt**, H. Ji, and Y. Ren, *Experimental measurements of the parallel and transverse Spitzer resistivities during collisional magnetic reconnection*, Phys. Plasmas, **13**, 055703 (2006)
15. M. Yamada, Y. Ren, H. Ji, J. Breslau, **S.P. Gerhardt**, R. Kulsrud, and A. Kuritsyn, *Experimental study of two fluid effects on magnetic reconnection in a laboratory plasma with variable collisionality*, Phys. Plasmas **13**, 052119 (2006)
16. M. Inomoto, **S.P. Gerhardt**, M. Yamada, H. Ji, E. Belova, Y. Ren, and A. Kuritsyn, *Coupling between global geometry and the local Hall effect leading to reconnection-layer symmetry breaking*, Phys. Rev. Lett. **97**, 135002 (2006)
17. **S.P. Gerhardt**, M. Inomoto, E. Belova, M. Yamada, H. Ji, Y. Ren, and A. Kuritsyn, *Equilibrium and stability studies of oblate field reversed configurations in the Magnetic Reconnection Experiment*, Phys. Plasmas **13**, 112508 (2006).
18. M. Yamada, H. Ji, **S.P. Gerhardt**, E.V. Belova, R.C Davison, and D.R. Mikkelsen, *A self-organized plasma with induction, reconnection, and injection techniques: the SPIRIT concept for field-reversed configuration research*, Plasma and Fusion Research **2**, 004 (2007).
19. A. Kuritsyn, H. Ji, **S.P. Gerhardt**, Y. Ren, and M. Yamada, *Effect of global boundary and local collisionality on magnetic reconnection in a laboratory plasma*, Geophys. Rev. Lett. **34**, L16106 (2007).
20. **S. P. Gerhardt**, E.V. Belova, M. Yamada, H. Ji, M. Inomoto, Y. Ren, and B. McGeehan, *Inductive sustainment of a field-reversed configuration stabilized by shaping, magnetic diffusion, and finite-Larmor-radius effects*, Phys. Rev. Lett. **99**, 245003 (2007).
21. **S.P. Gerhardt**, E.V. Belova, M. Yamada, H. Ji, M. Inomoto, Y. Ren and B. McGeehan, *New Method for inductively forming an oblate field reversed configuration from a spheromak*, Nuclear Fusion **48**, 032001 (2008).
22. **S. P. Gerhardt**, E.V. Belova, M. Yamada, H. Ji, M. Inomoto, C.M. Jacobson, R. Maqueda, B. McGeehan, and Y. Ren, *Inductive sustainment of oblate field-reversed configurations with the*

- assistance of magnetic diffusion, shaping, and finite-Larmor radius stabilization*, Phys. Plasmas **15**, 022502 (2008).
23. **S.P. Gerhardt**, E.V. Belova, M. Yamada, H. Ji, Y. Ren, B. McGeehan, and M. Inomoto, *Field-reversed configuration formation scheme utilizing a spheromak and solenoid induction*, Phys. Plasmas **15**, 032503 (2008).
24. Y. Ren, M. Yamada, H. Ji, **S. P. Gerhardt**, and R. Kulsrud, *Identification of the electron-diffusion region during magnetic reconnection in a laboratory plasma*, Phys. Rev. Lett **101**, 085003 (2008).
25. Y. Ren, M. Yamada, H. Ji, S. Dorfman, **S. P. Gerhardt**, and R. Kulsrud, *Experimental study of the Hall effect and electron diffusion region during magnetic reconnection in a laboratory plasma*, Phys. Plasmas **15**, 082113 (2008).
26. **S.P. Gerhardt**, J.E. Menard, and the NSTX Team, *Characterization of the plasma current quench during disruptions in the National Spherical Torus Experiment*, Nuclear Fusion **49**, 025002 (2009).
27. H. Ji, Y. Ren, M. Yamada, S. Dorfman, W. Daughton, **S. P. Gerhardt**, *New insights into the dissipation in the electron layer during magnetic reconnection*, Geophys. Res. Lett., **35**, L13106 (2008)
28. **S.P. Gerhardt**, D.P. Brennan, R. Buttery, R.J. La Haye, S. Sabbagh, E. Strait, M. Bell, R. Bell, E. Fredrickson, D. Gates, B. LeBlanc, J. Menard, D. Stutman, K. Tritz and H. Yuh, *Relationship between onset thresholds, trigger types and rotation shear for the  $m/n = 2/1$  neoclassical tearing mode in a high- $\beta$  spherical torus*, Nuclear Fusion **49**, 032003 (2009).
29. R. Raman, T.R. Jarboe, D. Mueller, B.A. Nelson, M.G. Bell, R. Bell, D. Gates, **S. Gerhardt**, J. Hosea, R. Kaita, H. Kugel, B. LeBlanc, R. Maingi, R. Maqueda, J. Menard, M. Nagata, M. Ono, S. Paul, L. Roquemore, S. Sabbagh, V. Soukhanovskii and G. Taylor, *Solenoid-free plasma startup in NSTX using transient CHI*, Nuclear Fusion **49**, 065006 (2009).
30. J.-K. Park, A. H. Boozer, J. E. Menard, A. M. Garofalo, M. J. Schaffer, R. J. Hawryluk, S. M. Kaye, **S. P. Gerhardt**, S. A. Sabbagh, and NSTX Team, *Importance of plasma response to nonaxisymmetric perturbations in tokamaks*, Phys. Plasmas **16**, 056115, (2009).
31. H.W. Kugel, M. Bell, L. Berzak, A. Brooks, R. Ellis, **S. P. Gerhardt**, H. Harjes, R. Kaita, J. Kallman, R. Maingi, R. Majeski, D. Mansfield, J. Menard, R.E. Nygren, V. Soukhanovskii, D. Stotler, P. Wakeland, L.E. Zakharov, *Physics design requirements for the National Spherical Torus liquid lithium divertor*, Fusion Eng. And Design **84**, 1125, (2009).
32. R. Maingi, T. H. Osborne, B. P. LeBlanc, R. E. Bell, J. Manickam, P. B. Snyder, J. E. Menard, D. K. Mansfield, H. W. Kugel, R. Kaita, **S. P. Gerhardt**, S. A. Sabbagh, F. A. Kelly, and the NSTX research team, *Edge-Localized-Mode Suppression through Density-Profile Modification with Lithium-Wall Coatings in the National Spherical Torus Experiment*, Phys. Rev. Lett. **103**, 075001 (2009).
33. J.-K. Park, A. H. Boozer, J. E. Menard, **S. P. Gerhardt**, and S. A. Sabbagh, *Shielding of external magnetic perturbations by torque in rotating tokamak plasmas*, Phys. Plasmas **16**, 082512 (2009)

## Conference Proceedings

1. F.S.B. Anderson, D.T. Anderson, A.F. Almagri, J. Chen, **S.P. Gerhardt**, V. Sakaguchi, J. Shafii, and J.N. Talmadge, *HSX Final Alignment, Assembly, and Initial Operation*, 12<sup>th</sup> International Stellarator Conference, Madison, Wisconsin, 1999.
2. D.T. Anderson, A.F. Almagri, F.S.B. Anderson, J. Chen, **S.P. Gerhardt**, V. Sakaguchi, J. Shafii, and J.N. Talmadge, *Initial Experimental Program Plans for HSX*, 12<sup>th</sup> International Stellarator Conference, Madison, Wisconsin, 1999.
3. **S.P. Gerhardt**, J.N. Talmadge, D.T. Anderson, and S.A. Dettrick, *Monte Carlo Diffusion Calculations and Plans for Electric Field Studies in HSX*, 12<sup>th</sup> International Stellarator Conference, Madison, Wisconsin, 1999.
4. **S.P. Gerhardt**, A. F. Almagri, D.T. Anderson, and J.N. Talmadge, *Initial Results from Biased Electrode Experiments in HSX*, Proceedings of the 13<sup>th</sup> International Stellarator Workshop, Canberra, Australia, 2002.
5. J.W. Radder, D.T. Anderson, **S.P. Gerhardt**, A.F. Almagri, F.S.B. Anderson, J.N. Talmadge, D.L. Brower, and C. Deng, *The Effects of Symmetry Breaking on Plasma Formation in the Helically Symmetric Experiment*, Proceedings of the 13<sup>th</sup> International Stellarator Workshop, Canberra, Australia, 2002.
6. J.N. Talmadge, D.T. Anderson, F.S.B. Anderson, A.F. Almagri, C. Lechte, **S.P. Gerhardt**, and J. Radder, *Transport in HSX ECH Plasmas at .5T*, Proceedings of the 13<sup>th</sup> International Stellarator Workshop, Canberra, Australia, 2002.
7. **S. P. Gerhardt**, A. Abdou, A. Almagri, D.T. Anderson, F.S.B. Anderson, D. Brower, J. Canik, C. Deng, W. Guttenfelder, K. Likin, S. Oh, J. Tabora, V. Sakaguchi, J. Scmitt, J.N. Talmadge, and K. Zhai, *Experimental Evidence of Improved Confinement with Quasisymmetry in HSX*, Proceedings of the 19<sup>th</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research (Lyon, 2002), IAEA.
8. K.M. Likin, J.N. Talmadge, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, C. Deng, **S.P. Gerhardt**, and K. Zhai, *Absorption of X-Wave at the Second Harmonic in HSX*, 15th Topical Conference on Radio Frequency Power in Plasmas, Moran, 2003.
9. **S.P. Gerhardt**, D.T. Anderson, J. Canik, and W. Guttenfelder, *Measurements and Modeling of Bias Induced Flows in the HSX Stellarator*, Proceedings of the 14<sup>th</sup> International Stellarator Workshop, Greifswald, Germany, 2003.
10. J. Canik, D.T. Anderson, **S.P. Gerhardt**, and J.N. Talmadge, *Neutral Density Measurements in HSX*, Proceedings of the 14<sup>th</sup> International Stellarator Workshop, Greifswald, Germany, 2003.
11. J.N. Talmadge, K.M. Likin, A. Abdou, A. Almagri, D.T. Anderson, F.S.B. Anderson, J. Canik, C. Deng, **S.P. Gerhardt**, and K. Zhai, *Electron Cyclotron Heating in Various Configurations of HSX*, Proceedings of the 14<sup>th</sup> International Stellarator Workshop, Greifswald, Germany, 2003.
12. **S. P. Gerhardt**, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, D. Brower, J.M. Canik, C. Deng, W. Gettenfelder, K.M. Likin, V. Sakaguchi, J.N. Talmadge, K. Zhai, *Measurement and Modeling of Electrode Biased Discharges in the HSX Stellarator*, Proceedings of the 20<sup>th</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research (Vilamoura, Portugal, 2004), IAEA.

13. J.N. Talmadge, J. Schmitt, **S.P. Gerhardt**, and D.T. Anderson, *Quasisymmetry-Breaking and Increased Parallel Viscous Damping near Magnetic Islands in HSX*, Proceedings of the 15<sup>th</sup> International Stellarator Workshop, Madrid, Spain, 2005.
14. **S. P. Gerhardt**, M. Inomoto, E.V. Belova, M. Yamada, H. Ji, and Y. Ren, *Studies of Free Boundary Field-Reversed Configurations with Improved Stability in the Magnetic Reconnection Experiment*, Proceedings of the 21<sup>st</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research, Paper IC/P7-13 (Chengdu, China, 2006), IAEA.
15. E. Belova, R.C. Davidson, H. Ji, M. Yamada, and **S. P. Gerhardt**, *Effects of Energetic Beam Ions on Stability Properties of Field Reversed Configurations*, Proceedings of the 21<sup>st</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research, Paper TH/P3-17, (Chengdu, China, 2006), IAEA.
16. S.A. Sabbagh, J.M. Bialek, R.E. Bell, J.W. Berkery, **S.P. Gerhardt**, O.N. Katsuro-Hopkins, J.E. Menard, R. Betti, D.A. Gates, B. Hu, B.P. LeBlanc, F.M. Levinton, J. Manickam, K. Tritz, and H. Yuh, *Advances in Global MHD Mode Stabilization Research on NSTX*, Proceedings of the 22<sup>nd</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research, Paper EX/5-1, (Geneva, Switzerland 2008), IAEA.
17. R. J. Buttery, **S.P. Gerhardt**, A. Isayama, R. J. La Haye, E. J. Strait, D. P. Brennan, P. Buratti, D. Chandra, S. Coda, J. De Grassie, P. Gohil, M. Gryaznevich, D. F. Howell, G. Jackson, C. Holcomb, M. Maraschek, A. Polevoi, H. Reimerdes, D. Raju, S. Sabbagh, S. Saarelma, M. Schaffer, A. Sen, the DIII-D, JT-60 and NSTX teams and JET-EFDA contributors, *Multimachine Extrapolation of Neoclassical Tearing Mode Physics to ITER*, Proceedings of the 22<sup>nd</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research, Paper EX/5-1, (Geneva, Switzerland, 2008), IAEA.
18. D. A. Gates, et al, *Overview of Results from the National Spherical Torus Experiment (NSTX)*, Proceedings of the 22<sup>nd</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research, Paper EX/5-1, (Geneva, Switzerland, 2008), IAEA.
19. R. Kaita, et al, *Plasma Performance Improvement with Lithium-Coated Plasma-Facing Components in NSTX*, Proceedings of the 22<sup>nd</sup> International Conf. on Plasma Physics and Controlled Nuclear Fusion Research, Paper EX/5-1, (Geneva, Switzerland, 2008), IAEA.
20. R. Maingi, et al, *Modification of edge plasma profiles in ELM-suppressed discharges with lithium coatings in NSTX*, 36<sup>th</sup> EPS Conference on Plasma Physics, Sofia, Bulgaria, 2009.
21. M. Bell, et al, *Plasma Response to Lithium Coated Plasma-Facing Components in the National Spherical Torus Experiment*, 36<sup>th</sup> EPS Conference on Plasma Physics, Sofia, Bulgaria, 2009.
22. L. Dalgado-Aparicio, et al, *Multi-energy SXR characterization of stabilized resistive wall modes in NSTX*, 36<sup>th</sup> EPS Conference on Plasma Physics, Sofia, Bulgaria, 2009.

**Conference Poster Presentations (incomplete):**

1. D.T. Anderson, A.F. Almagri, F.S.B Anderson, **S.P. Gerhardt**, P.H. Probert, V. Sakaguchi, J. Shafi, J.L. Shohet, J.N. Talmadge, and S. Kitajima, *Overview of the Initial HSX Experimental Program*, APS-DPP, New Orleans, 1998.
2. F.S.B. Anderson, D.T. Anderson, A. F. Almagri, **S.P. Gerhardt**, P.H. Probert, V. Sakaguchi, J. Shafi, J.L. Shohet, J. N. Talmadge, and S. Kitajima, *Fabrication and Initial Operation of the Helically Symmetric Experiment*, APS-DPP, New Orleans, 1998.

3. **S. P. Gerhardt**, J.N. Talmadge, and J.L. Shohet, *The Magnetic Field Structure outside the Separatrix in HSX*, APS-DPP, New Orleans, 1998.
4. J.L. Shohet, G. Han, **S.P. Gerhardt**, T. Budimulia, and A.F. Almagri, *Quantum Mechanical Non-Relativistic Spectra of Free-Free Bremsstrahlung from HSX*, APS-DPP, New Orleans, 1998.
5. D.T. Anderson, A.F. Almagri, F.S.B. Anderson, J. Chen, **S.P. Gerhardt**, V. Sakaguchi, J. Shafi, and J.N. Talmadge, *First Plasma Results and Initial Experimental Plan for HSX*, APS-DPP, Seattle, 1999.
6. J.N. Talmadge, A. Almagri, D.T. Anderson, F.S.B. Anderson, **S.P. Gerhardt**, V. Sakaguchi, J. Shafi, R. J. Vernon, T.S. Bigelow, and K.M. Likin, *Electron Cyclotron Heating at .5 T in HSX*, APS-DPP, Seattle, 1999.
7. **S.P. Gerhardt** and J.N. Talmadge, *Diffusion Coefficient and Electric Field Studies for HSX using Monte Carlo Methods*, APS-DPP, Seattle, 1999.
8. B.E. Chapman, J.K. Anderson, T.M. Biewer, S. Castillo, P.K. Chattopadhyay, C.S. Chiang, D.J. Craig, G. Fiksel, P.W. Fontanna, C.B. Forest, **S.P. Gerhardt**, A.K. Hansen, D.J. Den Hartog, D. Holly, N.E. Lanier, S.C. Prager, J.S. Sarff, D.L. Brower, and Y. Jiang, *Reduced Edge Instability and Improved Confinement in the MST RFP*, APS-DPP, Seattle, 1999.
9. S.R. Castillo, J.K. Anderson, T.M. Biewer, B.E. Chapman, C.B. Forest, **S. P. Gerhardt**, D.J. Den Hartog, and N.E. Lanier, *Measurement of the  $Z_{eff}$  Profile in MST*, APS-DPP, Seattle, 1999.
10. B.E. Chapman, J.K. Anderson, T.M. Biewer, S. Castillo, P.K. Chattopadhyay, C.S. Chaing, D.J. Craig, N.A. Crocker, G. Fiksel, P. W. Fontana, C.B. Forest, **S.P. Gerhardt**, A. K. Hansen, D.J. Den Hartog, D. Holly, N.E. Lanier, S.C. Prager, J. C. Reardon, J.S. Sarff, D.L. Brower, and Y. Jiang, *Modifications to confinement and the current profile with auxiliary current drive in the MST RFP*. APS-DPP, Quebec City, 2000.
11. D.T. Anderson, A.F. Almagri, F.S.B. Anderson, L. Feldner, **S.P. Gerhardt**, B. Harper, J.W. Radder, V. Sakaguchi, J. Shafii, J.N. Talmadge, R.J. Vernon, K. Zhai, D. L. Brower, and C. Deng, *ECH Operation of HSX at  $B=.5T$* , APS-DPP, Quebec City, 2000.
12. **S. P. Gerhardt**, J.N. Talmadge, *Spectroscopic Diagnostics on the HSX Stellarator*, APS-DPP, Quebec City, 2000.
13. J.W. Radder, D.T. Anderson, **S.P. Gerhardt**, A.F. Almagri, F.S.B. Anderson, J.N. Talmadge, D.L. Brower, and C. Deng, *The Effects of Symmetry Breaking on Plasma Formation in the Helically Symmetric Experiment*, APS-DPP, Long Beach, 2001.
14. A.F. Almagri, D.T. Anderson, C. Deng, **S.P. Gerhardt**, and J.N. Talmadge, *Effects of Symmetry on Energy Content and Soft X-ray Profiles in the Helically Symmetric Experiment*, APS-DPP, Long Beach, 2001.
15. **S.P. Gerhardt**, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, and J.N. Talmadge *Initial Results from Biased Electrode Experiments in HSX*, APS-DPP, Long Beach, 2001.
16. C. Deng, D.L. Brower, W.X. Ding, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, **S.P. Gerhardt**, P. Probert, J. Radder, and J.N. Talmadge, *Measurements of Electron Density Profile and Fluctuations in HSX*, APS-DPP, Long Beach, 2001.

17. **S.P. Gerhardt**, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, and J.N. Talmadge, *Measurements of Plasma Flow in the HSX Stellarator using Mach Probes and UV Spectroscopy*, 14<sup>th</sup> Topical Conference on High Temperature Plasma Diagnostics, Madison, 2002.
18. J. Canik, D.T. Anderson, **S.P. Gerhardt**, and J.N. Talmadge, *Measurements of Neutral Density and Fueling through  $H_{\alpha}$  Emission in HSX*, 14<sup>th</sup> Topical Conference on High Temperature Plasma Diagnostics, Madison, 2002.
19. **S.P. Gerhardt**, A.F. Almagri, D.T. Anderson, F.S.B. Anderson, J. Canik, and J.N. Talmadge, *Plasma Flow Studies in the HSX Stellarator*, APS-DPP, Orlando, 2002.
20. J.M. Canik, D.T. Anderson, **S.P. Gerhardt**, and J.N. Talmadge, *Evidence of Reduced Direct Losses in HSX*, APS-DPP, Orlando, 2002.
21. W.A. Guttenfelder, D.T. Anderson, J. Canik, **S.P. Gerhardt**, and J.N. Talmadge, *Initial Turbulence Probe Measurements in HSX*, APS-DPP, Orlando, 2002.
22. C. Deng, D.L. Brower, J.M. Canik, **S.P. Gerhardt**, D.T. Anderson, and F.S.B. Anderson, *Electron Density Distribution in HSX*, APS-DPP, Orlando, 2002.
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