

Kyle Morrison

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Education

Princeton University, 1996 – present

Ph.D. in Plasma Physics (in progress),
Experimenting with non-neutral, pure-electron plasma dynamics as an indicator of background gas pressure.

University of Florida,

B.S., Physics, high honors, 1996.
B.A., Mathematics, honors, 1996.
GPA: 3.72

Academic Experience

Research Assistant, Princeton University, 1996 – present

- Showed that the expansion of the EDG device electron plasma agrees with classical predictions at moderate (high vacuum) pressures.
- Assembled a standard, on-axis temperature diagnostic for EDG, and assisted in the design and testing of a vastly improved density diagnostic.
- Constructed and repaired control and diagnostic circuitry for MRX, CDX-U, and EDG.
- Supervised first-year graduate students performing projects on EDG.
- Streamlined and corrected the EDG data analysis codes.
- Composed and edited 1 refereed paper, 2 conference papers, and 4 conference posters, and edited various other papers and research proposals.
- Tested a Fourier-transform spectrometer for use on the CDX-U device.
- Measured Doppler-broadened spectral lines in the MRX device plasma.

Teaching Assistant, University of Florida, 1996

- Instructed 60 students in an introductory physics lab:
Assisted students with their experiments and graded papers.

Undergraduate Research, University of Florida, 1995-1996

- Conducted large simulations of chemical reactions.
- Wrote several programs to visualize the simulated reactions.

Refereed Publications

K. A. Morrison, R. C. Davidson, S. F. Paul, E. A. Belli and E. H. Chao, "Expansion Rate Measurements at Moderate Pressure of Nonneutral Electron Plasmas in the Electron Diffusion Gauge Experiment," *Physics of Plasmas* **8**, 3506 (2001).

E. H. Chao, R. C. Davidson, S. F. Paul, and K. A. Morrison, "Effects of Background Gas Pressure on the Dynamics of a Nonneutral Electron Plasma Confined in a Malmberg-Penning Trap," *Physics of Plasmas* **7**, 831 (2000).

Conference Proceedings

K. A. Morrison, S. F. Paul, R. C. Davidson, "Measurements of Plasma Expansion due to Background Gas in the Electron Diffusion Gauge Experiment," American Institute of Physics Conference Proceedings, 2003 Workshop on Non-Neutral Plasmas, in press (2003).

S. F. Paul, K. A. Morrison, R. C. Davidson, "Examination of $m=1$ Diocotron Mode Growth at Low Electron Densities," American Institute of Physics Conference Proceedings, 2003 Workshop on Non-Neutral Plasmas, in press (2003).

K. A. Morrison, R. C. Davidson, S. F. Paul, and T. G. Jenkins, "Investigation of the Expansion Rate Scaling of Plasmas in the Electron Diffusion Gauge Experiment," American Institute of Physics Conference Proceedings **606**, 416 (2002).

T. G. Jenkins, K. A. Morrison, R. C. Davidson and S. F. Paul, "Large-Amplitude $m=1$ Diocotron Mode Measurements in the Electron Diffusion Gauge Experiment," American Institute of Physics Conference Proceedings **606**, 298 (2002).

S. F. Paul, K. Morrison, R. C. Davidson, and T. G. Jenkins, " $m=1$ Diocotron Mode Damping in the Electron Diffusion Gauge Experiment," American Institute of Physics Conference Proceedings **606**, 305 (2002).

E. H. Chao, R. C. Davidson, S. F. Paul, and K. A. Morrison, "Effects of Background Gas Pressure on Pure Electron Plasma Dynamics in the Electron Diffusion Gauge Experiment," American Institute of Physics Conference Proceedings **498**, 278 (1999).

Conference Posters

K. A. Morrison, S. F. Paul, R. C. Davidson, "Measurements of Plasma Expansion due to Background Gas in the Electron Diffusion Gauge Experiment." 2003 Workshop on Non-Neutral Plasmas

S. F. Paul, K. A. Morrison, R. C. Davidson, "Examination of $m=1$ Diocotron Mode Growth at Low Electron Densities." 2003 Workshop on Non-Neutral Plasmas

K. Morrison, S. F. Paul, R. C. Davidson, "Measuring Plasma Expansion on the Electron Diffusion Gauge Experiment." APS April Meeting, Bull. Am. Phys. Soc. **48** (2), 101 (2003).

K. Morrison, S. F. Paul, R. C. Davidson, "Expansion Rate Scaling and Diagnostic Development on the Electron Diffusion Gauge Experiment." APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **47** (9), 123 (2002).

K. Morrison, R. C. Davidson, S. F. Paul, T. G. Jenkins, "Expansion Rate Scaling and Energy Evolution in the Electron Diffusion Gauge Experiment." APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **46** (8), 81 (2001).

S. F. Paul, K. Morrison, R. C. Davidson, T. G. Jenkins, "Extension of Pressure Measurement to 6×10^{-11} Torr Using the Dynamics of the $m=1$ Diocotron Mode." APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **46** (8), 81 (2001).

K. Morrison, R. C. Davidson, S. F. Paul, T. G. Jenkins, "Investigation of the Expansion Rate Scaling of Plasmas in the Electron Diffusion Gauge Experiment." 2001 Workshop on Non-Neutral Plasmas

K. Morrison, R. C. Davidson, S. F. Paul, E. Belli, and E. H. Chao, "Expansion Rate Scaling and Energy Evolution at Higher Pressures in the Electron Diffusion Gauge Experiment." APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **45** (7), 302 (2000).

K. Morrison, E. H. Chao, R. C. Davidson, S. F. Paul "Radial Expansion and Total Energy Evolution in a Pure Electron Plasma" APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **44** (1999).

E. H. Chao, K. Morrison, S. F. Paul, R. C. Davidson, "Dynamics of the m=1 Diocotron Mode and the Effect of Background Neutral Gas Pressure." APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **44** (1999).

K. Morrison, S.C. Hsu, H. Ji, M. Yamada, "Spectroscopic Measurements of Ion Temperature and Plasma Flow in the Magnetic Reconnection Experiment." APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **42** (1997).

S.C. Hsu, K.M. Morrison, H. Ji, M. Yamada, "Experimental Study of Ion Heating Mechanisms During Magnetic Reconnection" APS Division of Plasma Physics Meeting, Bull. Am. Phys. Soc. **42** (1997).

Skills

Computer: Windows, Macintosh, Unix, Linux environments.
Programmed in IDL, IBM's Data Explorer (DX), and Fortran.

Technical: Experience with ultra-high-vacuum systems, measurement and test equipment, diagnostic design and assembly, and data analysis.

Awards

National Merit Scholar, 1992
Florida Academic Scholar, 1992
Advanced Placement Scholar with Distinction, 1992
Gator Club Scholarship, 1992
Phi Beta Kappa, 1996
ASME member, 1993-1994
SPS member, 1993-1996
Sigma Pi Sigma, 1996
Golden Key Honor Society, 1994
Dean's List, Liberal Arts & Sciences, 1995
Dean's List, College of Engineering, 1993

Leadership Experience

Mailroom Manager at the graduate student dormitory at Princeton, 1998-1999

- Improved the efficiency of the yearly reorganizations and daily sorting procedures.
- Created a system for managing the 1-year grace period for address changes.

Representative in the Graduate Student Government at Princeton, 1998-2000

- Assembled a team to write a new Constitution, helped wage a political battle to get it enacted, and crafted the compromise resolution that broke the stalemate.
- Collaborated with the Undergraduate Student Government to effect change in the campus fire safety regulations.

References

Ronald C. Davidson (primary thesis advisor):

Professor, Program in Plasma Physics at Princeton University.

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(609) 243-3552 , rdavidso@pppl.gov

Stephen F. Paul (secondary thesis advisor):

Member of the Research Staff at Princeton Plasma Physics Laboratory.

Address: MS17, P.O. Box 451, Princeton, NJ 08543

(609) 243-3781 , spaul@pppl.gov

Robert Kaita (former research advisor):

Member of the Research Staff at Princeton Plasma Physics Laboratory.

Address: MS17, P.O. Box 451, Princeton, NJ 08543

(609) 243-3275 , kaita@pppl.gov