References

[1] http://plasmalab.pbworks.com.

[2] D.B. Schaeffer, Everson E.T., Bondarenko A.S., S.E. Clark, C.G. Constantin, S. Vincena, B. Van Compernolle, S.K.P. Tripathi, D. Winkse, W. Gekelman, and C. Niemann. Laser-driven, magnetized quasi-perpendicular collisionless shocks on the Large Plasma Device. *Phys. Plasmas*, 21:056312, 2014.

[3] C. Niemann, W. Gekelman, C. G. Constantin, E. T. Everson, D. B. Schaeffer, A. S. Bondarenko, S. E. Clark, D. Winske, S. Vincena, B. Van Compernolle, and P. Pribyl. Observation of collisionless shocks in a large current-free laboratory plasma. *Geophysical Research Letters*, 41(21):7413–7418, 2014.

[4] S. E. Clark, E. T. Everson, D. B. Schaeffer, A. S. Bondarenko, C. G. Constantin, C. Niemann, and D. Winske. Enhanced collisionless shock formation in a magnetized plasma containing a density gradient. *Phys. Rev. E*, 90:041101, Oct 2014.

[5] R.M. Thorne. Radiation belt dynamics: The importance of wave-particle interactions. *Geophysical Research Letters*, 37(22):L22107, 2010.

[6] G. D. Reeves, H. E. Spence, M. G. Henderson, S. K. Morley, R. H. W. Friedel, H. O. Funsten, D. N. Baker, S. G. Kanekal, J. B. Blake, J. F. Fennell, S. G. Claudepierre, R. M. Thorne, D. L. Turner, C. A. Kletzing, W. S. Kurth, B. A. Larsen, and J. T. Niehof. Electron acceleration in the heart of the van allen radiation belts. *Science*, 341(6149):991–994, 2013.

[7] Richard B. Horne, Richard M. Thorne, Sarah A. Glauert, Jay M. Albert, Nigel P. Meredith, and Roger R. Anderson. Timescale for radiation belt electron acceleration by whistler mode chorus waves. *Journal of Geophysical Research: Space Physics*, 110(A3):A03225, 2005.

[8] R. M. Thorne, W. Li, B. Ni, Q. Ma, J. Bortnik, L. Chen, D. N. Baker, H. E. Spence, G. D. Reeves, M. G. Henderson, C. A. Kletzing, W. S. Kurth, G. B. Hospodarsky, J. B. Blake, J. F. Fennell, S. G. Claudepierre, and S. G. Kanekal. Rapid local acceleration of relativistic radiation-belt electrons by magnetospheric chorus. *Nature*, 504(7480):411–414, 12 2013.

[9] B. Van Compernolle, J. Bortnik, P. Pribyl, W. Gekelman, M. Nakamoto, X. Tao, and R. M. Thorne. Direct detection of resonant electron pitch angle scattering by whistler waves in a laboratory plasma. *Phys. Rev. Lett.*, 112:145006, Apr 2014.

[10] B. Van Compernolle, X. An, J. Bortnik, R. M. Thorne, P. Pribyl, and W. Gekelman. Excitation of chirping whistler waves in a laboratory plasma. *Phys. Rev. Lett.*, 114:245002, Jun 2015.

[11] Y. Zhang, H. Boehmer, W. W. Heidbrink, R. McWilliams, D. Leneman, and S. Vincena. Lithium ion sources for investigations of fast ion transport in magnetized plasmas. *Review of Scientific Instruments*, 78(1):–, 2007.

[12] S. K. P. Tripathi, P. Pribyl, and W. Gekelman. Development of a radio-frequency ion beam source for fast-ion studies on the large plasma device. *Review of Scientific Instruments*, 82(9):–, 2011.

[13] L. Zhao, W. W. Heidbrink, H. Boehmer, R. McWilliams, D. Leneman, and S. Vincena. Measurements of classical transport of fast ions. *Physics of Plasmas*, 12(5):–, 2005.

[14] Yang Zhang, W. W. Heidbrink, H. Boehmer, R. McWilliams, Guangye Chen, B. N. Breizman, S. Vincena, T. Carter, D. Leneman, W. Gekelman, P. Pribyl, and B. Brugman. Spectral gap of shear alfvén waves in a periodic array of magnetic mirrors. *Physics of Plasmas*, 15(1):–, 2008.

[15] Yang Zhang, W. W. Heidbrink, H. Boehmer, R. McWilliams, S. Vincena, T. A. Carter, W. Gekelman, D. Leneman, and P. Pribyl. Observation of fast-ion doppler-shifted cyclotron resonance with shear alfvén waves. *Physics of Plasmas*, 15(10):–, 2008.

[16] Yang Zhang, W. W. Heidbrink, Shu Zhou, H. Boehmer, R. McWilliams, T. A. Carter, S. Vincena, and M. K. Lilley. Doppler-shifted cyclotron resonance of fast ions with circularly polarized shear alfvén waves). *Physics of Plasmas*, 16(5):–, 2009.

[17] Shu Zhou, W. W. Heidbrink, H. Boehmer, R. McWilliams, T. Carter, S. Vincena, S. K. P. Tripathi, P. Popovich, B. Friedman, and F. Jenko. Turbulent transport of fast ions in the large plasma device. *Physics of Plasmas*, 17(9):–, 2010.

[18] S. Zhou, W. W. Heidbrink, H. Boehmer, R. McWilliams, T. A. Carter, S. Vincena, B. Friedman, and D. Schaffner. Sheared-flow induced confinement transition in a linear magnetized plasma. *Physics of Plasmas*, 19(1):–, 2012.

[19] Shu Zhou, W. W. Heidbrink, H. Boehmer, R. McWilliams, T. A. Carter, S. Vincena, S. K. P. Tripathi, and B. Van Compernolle. Thermal plasma and fast ion transport in electrostatic turbulence in the large plasma devicea). *Physics of Plasmas*, 19(5):–, 2012.

[20] W W Heidbrink, H Boehmer, R McWilliams, A Preiwisch, Y Zhang, L Zhao, S Zhou, A Bovet, A Fasoli, I Furno, K Gustafson, P Ricci, T Carter, D Leneman, S K P Tripathi, and S Vincena. Measurements of interactions between waves and energetic ions in basic plasma experiments. *Plasma Physics and Controlled Fusion*, 54(12):124007, 2012.

[21] T. A. Carter. Intermittent turbulence and turbulent structures in a linear magnetized plasma. *Phys. Plasmas*, 13:010701, 2006.

[22] D. C. Pace, M. E. Austin, E. M. Bass, R. V. Budny, W. W. Heidbrink, J. C. Hillesheim, C. T. Holcomb, M. Gorelenkova, B. A. Grierson, D. C. McCune, G. R. McKee, C. M. Muscatello, J. M. Park, C. C. Petty, T. L. Rhodes, G. M. Staebler, T. Suzuki, M. A. Van Zeeland, R. E. Waltz, G. Wang, A. E. White, Z. Yan, X. Yuan, and Y. B. Zhu. Energetic ion transport by microturbulence is insignificant in tokamaksa). *Physics of Plasmas*, 20(5):–, 2013.

[23] A. Bovet, I. Furno, A. Fasoli, K. Gustafson, and P. Ricci. Investigation of fast ion transport in torpex. *Nuclear Fusion*, 52(9):094017, 2012.

[24] R. S. Iroshnikov. The turbulence of a conducting fluid in a strong magnetic field. *Astron. Zh.*, 40:742, 1963. English Translation: Sov. Astron., 7 566 (1964).

[25] R. H. Kraichnan. Inertial range spectrum of hyromagnetic turbulence. *Phys. Fluids*, 8:1385–1387, 1965.

[26] D. J. Thuecks, C. A. Kletzing, F. Skiff, S. R. Bounds, and S. Vincena. Tests of collision operators using laboratory measurements of shear Alfvén wave dispersion and damping. *Phys. Plasmas*, 16(5):052110–+, May 2009.

[27] C. A. Kletzing, D. J. Thuecks, F. Skiff, S. R. Bounds, and S. Vincena. Measurements of Inertial Limit Alfvén Wave Dispersion for Finite Perpendicular Wave Number. *Phys. Rev. Lett.*, 104(9):095001–+, March 2010.

[28] D. W. Auerbach, T. A. Carter, S. Vincena, and P. Popovich. Resonant drive and nonlinear suppression of gradient-driven instabilities via interaction with shear Alfvén waves. *Phys. Plasmas*, 18(5):055708–+, May 2011.

[29] G. G. Howes and K. D. Nielson. Alfvén wave collisions, the fundamental building block of plasma turbulence. I. Asymptotic solution. *Phys. Plasmas*, 20(7):072302, July 2013.

[30] K. D. Nielson, G. G. Howes, and W. Dorland. Alfvén wave collisions, the fundamental building block of plasma turbulence. II. Numerical solution. *Physics of Plasmas*, 20(7):072303, July 2013.

[31] G. G. Howes, K. D. Nielson, D. J. Drake, J. W. R. Schroeder, F. Skiff, C. A. Kletzing, and T. A. Carter. Alfvén wave collisions, the fundamental building block of plasma turbulence. III. Theory for experimental design. *Physics of Plasmas*, 20(7):072304, July 2013.

[32] G. G. Howes, D. J. Drake, K. D. Nielson, T. A. Carter, C. A. Kletzing, and F. Skiff. Toward Astrophysical Turbulence in the Laboratory. *Phys. Rev. Lett.*, 109(25):255001, December 2012.

[33] D. J. Drake, J. W. R. Schroeder, G. G. Howes, C. A. Kletzing, F. Skiff, T. A. Carter, and D. W. Auerbach. Alfvén wave collisions, the fundamental building block of plasma turbulence. IV. Laboratory experiment. *Physics of Plasmas*, 20(7):072901, July 2013.

[34] Yuhou Wang, Walter Gekelman, Patrick Pribyl, and Konstantinos Papadopoulos. Scattering of magnetic mirror trapped fast electrons by a shear alfvén wave. *Phys. Rev. Lett.*, 108:105002, Mar 2012.

[35] Y. Wang, W. Gekelman, and P. Pribyl. Hard x-ray tomographic studies of the destruction of an energetic electron ring. *Review of Scientific Instruments*, 84(5):053503, 2013.

[36] Y. Wang, W. Gekelman, P. Pribyl, and K. Papadopoulos. Enhanced loss of magnetic-mirror-trapped fast electrons by a shear alfvén wave. *Physics of Plasmas*, 21(5):055705, 2014.

[37] O. A. Rosso, H. A. Larrondo, M. T. Martin, A. Plastino, and M. A. Fuentes. Distinguishing noise from chaos. *Phys. Rev. Lett.*, 99:154102, Oct 2007.

[38] Christoph Bandt and Bernd Pompe. Permutation entropy: A natural complexity measure for time series. *Phys. Rev. Lett.*, 88:174102, Apr 2002.

[39] D. C. Pace, M. Shi, J. E. Maggs, G. J. Morales, and T. A. Carter. Exponential frequency spectrum and lorentzian pulses in magnetized plasmas. *Physics of Plasmas*, 15(12):122304, 2008.

[40] J E Maggs and G J Morales. Exponential power spectra, deterministic chaos and lorentzian pulses in plasma edge dynamics. *Plasma Physics and Controlled Fusion*, 54(12):124041, 2012.

[41] J. E. Maggs and G. J. Morales. Origin of lorentzian pulses in deterministic chaos. *Phys. Rev. E*, 86:015401, Jul 2012.

[42] J E Maggs and G J Morales. Permutation entropy analysis of temperature fluctuations from a basic electron heat transport experiment. *Plasma Physics and Controlled Fusion*, 55(8):085015, 2013.

[43] J E Maggs, T L Rhodes, and G J Morales. Chaotic density fluctuations in l-mode plasmas of the diii-d tokamak. *Plasma Physics and Controlled Fusion*, 57(4):045004, 2015.

[44] S. T. Vincena, G. J. Morales, and J. E. Maggs. Effect of two ion species on the propagation of shear Alfvén waves of small transverse scale. *Physics of Plasmas*, 17(5):052106, 2010.

[45] S. T. Vincena, W. A. Farmer, J. E. Maggs, and G. J. Morales. Laboratory realization of an ion-ion hybrid alfvén wave resonator. *Geophysical Research Letters*, 38(11):L11101, 2011.

[46] W. A. Farmer and G. J. Morales. Cherenkov radiation of shear alfvén waves in plasmas with two ion species. *Physics of Plasmas*, 19(9):092109, 2012.

[47] S. T. Vincena, W. A. Farmer, J. E. Maggs, and G. J. Morales. Investigation of an ion-ion hybrid alfvén wave resonator. *Physics of Plasmas*, 20(1):012111, 2013.

[48] W. A. Farmer and G. J. Morales. Propagation of shear alvÃ©n waves in two-ion species plasmas confined by a nonuniform magnetic field. *Physics of Plasmas*, 20(8):–, 2013.

[49] W. A. Farmer and G. J. Morales. The ion-ion hybrid alfvén resonator in a fusion environment. *Physics of Plasmas*, 21(6):062507, 2014.

[50] Eric E. Lawrence and Walter Gekelman. Identification of a quasiseparatrix layer in a reconnecting laboratory magnetoplasma. *Phys. Rev. Lett.*, 103:105002, Sep 2009.

[51] W Gekelman, E Lawrence, A Collette, S Vincena, B Van Compernolle, P Pribyl, M Berger, and J Campbell. Magnetic field line reconnection in the current systems of flux ropes and alfvén waves. *Physica Scripta*, 2010(T142):014032, 2010.

[52] B. Van Compernolle, W. Gekelman, P. Pribyl, and C. M. Cooper. Wave and transport studies utilizing dense plasma filaments generated with a lanthanum hexaboride cathode. *Physics of Plasmas*, 18(12):123501, 2011.

[53] Walter Gekelman, Bart Van Compernolle, Tim DeHaas, and Stephen Vincena. Chaos in magnetic flux ropes. *Plasma Physics and Controlled Fusion*, 56(6):064002, 2014.

[54] P. W. Terry. Suppression of turbulence and transport by sheared flow. *Rev. Mod. Phys.*, 72:109–165, 2000.

[55] J. E. Maggs, T. A. Carter, and R. J. Taylor. Transition from bohm to classical diffusion due to edge rotation of a cylindrical plasma. *Phys. Plasmas*, 14:052507, 2007.

[56] T. A. Carter and J. E. Maggs. Modifications of turbulence and turbulent transport associated with a bias-induced confinement transition in the large plasma device. *Phys. Plasmas*, 16:012304, 2009.

[57] D. A. Schaffner, T. A. Carter, G. D. Rossi, D. S. Guice, J. E. Maggs, S. Vincena, and B. Friedman. Modification of turbulent transport with continuous variation of flow shear in the large plasma device. *Phys. Rev. Lett.*, 109:135002, 2012.

[58] D. A. Schaffner, T. A. Carter, G. D. Rossi, D. S. Guice, J. E. Maggs, S. Vincena, and B. Friedman. Turbulence and transport suppression scaling with flow shear on the large plasma device. *Phys. Plasmas*, 20:055907, 2013.

[59] G. M. Staebler, R. E. Waltz, J. Candy, and J. E. Kinsey. New paradigm for suppression of gyrokinetic turbulence by velocity shear. *Phys. Rev. Lett.*, 110:055003, Jan 2013.

[60] P. Popovich, M. V. Umansky, T. A. Carter, and B. Friedman. Analysis of plasma instabilities and verification of bout code for linear plasma device. *Phys. Plasmas*, 17:102107, 2010.

[61] P. Popovich, M. V. Umansky, T. A. Carter, and B. Friedman. Modeling of plasma turbulence and transport in the large plasma device. *Phys. Plasmas*, 17:122312, 2010.

[62] M. V. Umansky, P. Popovich, T. A. Carter, B. Friedman, and W. M. Nevins. Numerical simulation and analysis of plasma turbulence the large plasma device. *Phys. Plasmas*, 18:055709, 2011.

[63] B. Friedman, M. V. Umansky, and T. A. Carter. Grid convergence study in a simulation of lapd turbulence. *Contrib. Plasma Phys.*, 52:412–416, 2012.

[64] B. Friedman, T. A. Carter, M. V. Umansky, D. Schaffner, and B. Dudson. Energy dynamics in a simulation of lapd turbulence. *Phys. Plasmas*, 19:102307, 2012.

[65] B. Friedman, T. A. Carter, M. V. Umansky, D. Schaffner, and I. Joseph. Nonlinear instability in simulations of large plasma device turbulence. *Phys. Plasmas*, 20:055704, 2013.

[66] B. Friedman and T.A. Carter. Linear technique to understand non-normal turbulence applied to a magnetized plasma. *Phys. Rev. Lett.*, 113:025003, 2014.

[67] B. Friedman and T.A. Carter. A non-modal analytical method to predict turbulent properties applied to the Hasegawa-Wakatani model. *Phys. Plasmas*, 22:012307, 2015.

[68] J. F. Drake, A. Zeiler, and D. Biskamp. Nonlinear self-sustained drift-wave turbulence. *Phys. Rev. Lett.*, 75:4222, 1995.

[69] D. Biskamp and A. Zeiler. Nonlinear instability mechanism in 3d collisional drift-wave turbulence. *Phys. Rev. Lett.*, 74:706, 1995.

[70] B. D. Scott. Self-sustained collisional drift-wave turbulence in a sheared magnetic field. *Phys. Rev. Lett.*, 65:3289, 1990.

[71] Akira Hasegawa and Liu Chen. Kinetic processes in plasma heating by resonant mode conversion of alfvén wave. *Physics of Fluids (1958-1988)*, 19(12):1924–1934, 1976.

[72] Robert L. Lysak and William Lotko. On the kinetic dispersion relation for shear alfvén waves. *Journal of Geophysical Research: Space Physics*, 101(A3):5085–5094, 1996.

[73] Aaron Barnes. Collisionless damping of hydromagnetic waves. 9(8):1483–1495, 1966.

[74] B. Van Compernolle, G. J. Morales, J. E. Maggs, and R. D. Sydora. Laboratory study of avalanches in magnetized plasmas. *Phys. Rev. E*, 91:031102, Mar 2015.