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Nonlinear Convective Heat Transport in Multiple Interacting Magnetized Electron Temperature Filaments SCOTT KARBASHEWSKI, RICHARD SYDORA, University of Alberta, Canada, BART VAN COMPERNOLLE, GEORGE MORALES, JAMES MAGGS, UCLA — Results are presented from basic heat transport experiments and gyrokinetic simulations of multiple magnetized electron temperature filaments in close proximity. This arrangement samples cross-field transport from nonlinear drift-Alfven waves and large scale convective cells. Experiments are performed in the Large Plasma Device (LAPD) at UCLA. A biased LaB6 cathode injects low energy electrons (below ionization energy) along a strong magnetic field into a pre-existing large and cold plasma forming an electron temperature filament embedded in a colder plasma, and far from the machine walls. A carbon masking plate with several holes (each 1cm diameter, 1.5cm apart) is used to create 3 electron temperature filaments. By covering two holes in the mask drift-Alfven and thermal waves from a single filament have been characterized and compared to previous studies with a different electron beam source (Pace et al., Phys. Plasmas, 15, 122304 (2008)). The observed eigenmode structures also compares favorably with recent 3D gyrokinetic simulations (Sydora et al., Phys. Plasmas, 22, 102303 (2015)). The 3-filament case exhibits a complex wave pattern and enhanced cross-field transport. Detailed mode analysis and comparison with nonlinear simulations is reported.

Richard Sydora
University of Alberta

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