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Drift-Alfven Fluctuations and Transport in Multiple Interacting Magnetized Electron Temperature Filaments[1] RICHARD SYDORA, SCOTT KARBASHEWSKI, University of Alberta, BART VAN COMPERNOLLE, MATT POULOS, UCLA — Steep thermal gradients in a magnetized plasma can induce a variety of spontaneous low frequency excitations such drift-Alfven waves and vortices. We present results from basic experiments on heat transport in magnetized plasmas with multiple heat sources in close proximity. The setup consists of three biased probe-mounted CeB6 crystal cathodes that inject low energy electrons along a strong magnetic field into a pre-existing cold afterglow plasma forming three electron temperature filaments. A triangular spatial pattern is chosen for the thermal sources and multiple axial and transverse probe measurements allow for determination of the cross-field mode patterns and axial filament length. When the three sources are placed within a few collisionless electron skin depths a non-azimuthally symmetric wave pattern emerges due to the overlap of drift-Alfven modes forming around each filament. This leads to enhanced cross-field transport from chaotic mixing (EB) and profile collapse of the inner triangular region and steepened thermal gradients in the outer triangular region which spontaneously generates quasi-symmetric higher azimuthal mode number drift-Alfven fluctuations. In addition a sheared azimuthal flow is present from the emissive cathode that modifies the Alfvenic eigenmodes.

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Richard Sydora
University of Alberta

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