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**Investigation of Drift-Driven Turbulence on Electron Transport in a Low Power Magnetic Nozzle**[1] SHADRACH HEPNER, BENJAMIN JORNS, University of Michigan, PLASMADYNAMICS AND ELECTRIC PROPULSION LABORATORY TEAM — This work investigates the presence of instabilities and their effects on electron detachment in a low power magnetic nozzle. We have previously observed a lower hybrid drift instability (LHDI) and an anti-drift instability (ADI) in these devices. This work expands on the previous works with a sweep of operating conditions to determine when the LHDI and ADI are present and significant in inducing electron transport. We employ three diagnostics for this test. First, we implement a Langmuir probe sweep in two dimensions to verify the ADI and LHDI dispersion relations with background plasma parameters. We then supplement these measurements using probe pairs observing frequency and three-dimensional wavevectors of local fluctuations. The spectra read from the probe pairs act as direct measurements of unstable modes. We then take high speed imagery data in the upstream portion, observing the coherent modes non-invasively. The relative impact of each of these waves is evaluated by calculating the effective collision frequency. We determine the dependencies of the presence and impact of these waves on the plasma and thruster conditions and discuss means of altering their significance in electron transport.

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Shadrach Hepner
University of Michigan

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