Abstract Submitted
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Characterization of the Electron Energy Distribution Function in a Penning Discharge VALENTIN SKOUTNEV, PAUL DOURBAL, YEVGENY RAITSES, Princeton Plasma Physics Laboratory — Slow and fast sweeping Langmuir probe diagnostics were implemented to measure the electron energy distribution function (EEDF) in a cross-field Penning discharge undergoing rotating spoke phenomenon. The EEDF was measured using the Druyvesteyn method [1]. Rotating spoke occurs in a variety of ExB devices and is characterized primarily by azimuthal light, density, and potential fluctuations on the order of a few kHz, but is theoretically still not well understood [2] [3]. Characterization of a time-resolved EEDF of the spoke would be important for understanding physical mechanisms responsible for the spoke and its effects on Penning discharges, Hall thrusters, sputtering magnetrons, and other ExB devices. In this work, preliminary results of measurements of the EEDF using slow and fast Langmuir probes that sweep below and above the fundamental spoke frequency will be discussed. This work was supported by the Air Force Office of Scientific Research (AFOSR). [1] Godyak, V. A., Demidov, V. I. (2011). J of Physics D, 44(23), 233001. [2] Ellison, C. L., Raitses, Y., Fisch, N. J. (2012). Plasmas, 19(1), 013503. [3] Raitses, Y., Kaganovich, I., Smolyakov, A. IEPC/ISTS, Kobe, Japan (2015).

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