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Effect of the magnetic field on rotating spoke in ExB discharge¹ EDUARDO RODRIGUEZ, Princeton University, Department of Astrophysical Sciences, YEVGENY RAITSES, Princeton Plasma Physics Laboratory, ANDREW POWIS, Princeton University, Department of Mechanical and Aerospace Engineering, IGOR KAGANOVICH, Princeton Plasma Physics Laboratory, ANDREI SMOLYAKOV, University of Saskatchewan — The internal structure and behavior of self-organised quasi-periodic m=1 mode disturbances (so called rotating spokes) in low pressure ExB discharges is studied, and the effect that the magnetic field has on it is experimentally pursued. Both the influence of the field magnitude and topology are explored in an ExB Penning discharge [1], with particular emphasis on fringing/divergent B fields. The assessment of cross-field anomalous transport in the plasma is a primary focus of this research. For example, probe measurements of plasma density and plasma potential variations demonstrate that the electron crossfield current due to these fluctuations is nearly 90% of the total discharge current. Changes of the magnetic field topology can lead to a significant reduction of the spoke with quieter oscillations, partially consistent with our suppression predictions from Particle-in-Cell Simulations. [1] J. Carlsson, et al., Phys. Plasmas 25, 061201 (2018)

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