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Driving Azimuthal Modes in Magnetized Discharge with Segmented Anode YUAN SHI, YEVGENY RAITSES, AHMED DIALLO, Princeton Plasma Physics Laboratory — Coherently rotating azimuthal modes in a magnetized discharge of the cylindrical Hall thruster were driven using segmented anode. Unlike naturally occurring spoke which rotates only in ExB direction with some specific frequency, coherently rotating modes can be driven in both ExB and -ExB directions, whose frequencies exactly follow driving frequencies. To drive these modes, square-wave voltage between 225 V and 275 V was applied onto four anode segments with successive 90° phase shift. The driving circuit was operated at frequencies ranged from 50 KHz to -50 KHz. Modes appeared to be less intense but more coherent in "direct" magnetic configuration compared to "cusp"; and for each magnetic configuration, the degree of coherence showed strong dependence on driving frequency. Driving at frequencies deviate from the spoke frequency suppressed the naturally occurring azimuthal mode, while driving at spoke frequency enhanced the coherence of natural spoke. This resonant behavior was observed by a fast camera as well as current through anode segments.

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