

Abstract Submitted  
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**Rotating Spoke in a Cylindrical Hall Thruster**<sup>1</sup> JEFFREY B. PARKER, YEVGENY RAITSES, NATHANIEL J. FISCH, Princeton Plasma Physics Laboratory — In a cylindrical Hall thruster (CHT)<sup>2</sup>, a spoke of increased visible light emission propagates azimuthally and has been imaged with the use of a high speed camera. The spoke frequency is about 15 kHz. The observation of the rotating spoke depends on the magnetic field configuration. When the CHT is configured to have a cusp magnetic field, the rotating spoke is visible, while when it is configured to have an enhanced mirror field, the rotating spoke is not visible. The rotating spoke is also suppressed due to enhancing the cathode electron emission above its self-sustained level. In the regimes where the rotating spoke is not visible, steady-state probe measurements have found the electron cross-field mobility to be reduced<sup>3</sup>, indicating the spoke may contribute to anomalous electron transport.

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<sup>2</sup>Y. Raitses and N. J. Fisch, *Phys. Plasmas* 8, 2579 (2001)

<sup>3</sup>A. Smirnov, Y. Raitses, and N. J. Fisch, *Phys. Plasmas* 14, 057106 (2007)

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