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Numerical results of the Hall thruster discharge with an electrode in the near-plume region¹ ROBERT SANTOS, EDUARDO AHEDO, YEVGENY RAITSES, NATHANIEL J. FISCH, Princeton Plasma Physics Laboratory, Princeton, NJ 08543, USA — Recent experimental results indicated that for Hall thrusters (HT), the use of additional intermediate electrodes between the cathode and the anode placed in the plasma plume or at the channel exit can affect large amplitude, low frequency oscillations of the discharge current and the plasma plume divergence. In this work, we study numerically the effects on the discharge current, and on the plume characteristics of the HT, of an electrode placed in the near-plume region. For that purpose, a 2D hybrid PIC-fluid code is used to simulate the plasma discharge. Preliminary results remark two important aspects. First, the electrode effects also modify the plasma magnitudes in the channel of the thruster, and second, the electron turbulence model is a key factor to understand the plasma discharge.

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