Abstract Submitted
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Oscillation analysis in Hall thrusters with 2D (axial-azimuthal) Particle-In-Cell simulations[1] THOMAS CHAROY, Laboratoire de Physique des Plasmas, Ecole Polytechnique, TREVOR LAFLEUR, PlasmaPotential - Physics Consulting and Research, Australia, PASCAL CHABERT, ANNE BOURDON, Laboratoire de Physique des Plasmas, Ecole Polytechnique — Hall Thrusters (HT) have been widely used for spacecraft propulsion. However, even though many studies have been conducted, the electron transport across the magnetic field is still not well understood. It has been experimentally observed that the electron mobility across the discharge chamber is higher than the one expected with the classical collisional theory. Recent studies have shown that this anomalous transport could be due to the Electron Cyclotron Drift Instabilities (ECDI). Nevertheless, many other instabilities can be observed in a HT, with a wide range of frequencies and they might also affect the discharge behavior. 2D Particle-In-Cell (PIC) simulations of the axial-azimuthal plane of a HT have been performed with *LPPic*, a code recently validated with a 2D ExB benchmark. Compared to the latest, here we solved the neutral gas dynamic self-consistently and hence, we were able to capture the breathing mode oscillations along with the ECDI and the ion-transit time instabilities. We studied the coupling between these instabilities, with comparison to the theory recently developed by Lafleur et al. The influence of the vacuum permittivity scaling factor on the dischare behaviour has also been analyzed.

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