

Abstract Submitted
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Phase-resolved emission spectroscopy of a neutraliser-free gridded ion thruster¹ JAMES DEDRICK, York Plasma Institute, University of York, ANDREW GIBSON, York Plasma Institute, University of York and Laboratoire de Physique des Plasmas (LPP-CNRS), Ecole Polytechnique, DMYTRO RAFALSKYI, ANE AANESLAND, Laboratoire de Physique des Plasmas (LPP-CNRS), Ecole Polytechnique — Power-efficient electric propulsion systems that operate without an external neutraliser have the potential to increase the longevity of traditional concepts. The Neptune gridded-ion thruster prototype, which uses a single radio-frequency (rf) power source for plasma generation, ion acceleration and beam neutralisation, is under development. Previous research has suggested that the time-resolved electron dynamics in the plume are important for maintaining charge neutrality and overall performance. In this study, the electron dynamics in the exhaust beam are investigated within the rf cycle using phase-resolved emission spectroscopy. The results are compared with time-resolved and time-integrated electrical diagnostics to investigate the mechanisms behind beam neutralisation.

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