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Plasma simulation in a hybrid ion electric propulsion system MANISH JUGROOT, ALEX CHRISTOU, Royal Military College of Canada — An exciting possibility for the next generation of satellite technology is the microsatellite. These satellites, ranging from 10-500 kg, can offer advantages in cost, reduced risk, and increased functionality for a variety of missions. For station keeping and control of these satellites, a suitable compact and high efficiency thruster is required. Electrostatic propulsion provides a promising solution for microsatellite thrust due to their high specific impulse. The rare gas propellant is ionized into plasma and generates a beam of high speed ions by electrostatic processes. A concept explored in this work is a hybrid combination of dc ion engines and hall thrusters to overcome space-charge and lifetime limitations of current ion thruster technologies. A multiphysics space and time-dependent formulation was used to investigate and understand the underlying physical phenomena. Several regions and time scales of the plasma have been observed and will be discussed.

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