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Characterisation of plume and thrust for the corona ionisation space propulsion system

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Abstract content
 (Max 300 words)
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The corona ionization space propulsion system (Corion) is a miniaturized plasma thruster intended to work on small satellites and space probes. It operates by ionizing a neutral gas fed through thin needles via corona ionization at the needle tips and creating a positive and negative stream of plasma, which provides thrust. Analytic descriptions of this system have not taken electrons into account, and we use a fluid simulation to include these effects. The simulation yields information about the local electric fields, local mobility constant, ion and electron currents, charge densities, power transfer into the gas of the neutral plume by both ions and electrons and thrust densities. A description for the thrust is presented next, which is the sum of a number of different contributions from cold gas thrust, ion acceleration, ion/neutral drag forces and Joule heating of the plume.

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no

Level for award (Hons, MSc, PhD)?

n/a

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no

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