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Fluid Simulation for Corona ionization Thruster

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Abstract content
   (Max 300 words)

The corona ionization thruster produces thrust by ejecting gas through a hollow, highly electrically charged needle, where ionization of neutral gas molecules and consequent acceleration takes place. The exact mechanism for thrust production is still vague. Using the drift-diffusion approximation, we develop a spherically symmetric fluid simulation to model aspects of the plasma jet system. In contrast to a previous model , we demonstrate that downstream ionization can be significant, and that electron pressure effects are vital for maintaining quasi-neutrality and reproducing the correct dc discharge behavior. Simulations are performed for various voltage and pressures ranges at the needle tip of around 2–4 Torr.

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