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SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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OPERATING THE ALTERNATIVE PROPELLANT IODINE IN RADIO FREQUENCY ION THRUSTERS

Abstract

Radio frequency ion thrusters (RIT) are based on the ionization and electrostatic acceleration of propellant. The propellant should satisfy the following requirements: low ionisation potential, and easy transfer into the gaseous state. Iodine represents a promising candidate as a propellant in RIT, which is currently analyzed at the I. Physical Institute of Justus-Liebig-University of Giessen. We present optical emission spectra data of inductively and capacitively coupled iodine plasmas in dependency of the neutral gas density and the performance that is coupled into the plasma for diagnosis of ion thrusters. These spectra will be compared with theoretical models to determine the relevant plasma parameters, degree of ionization and electron density, for the RIT. Finally we will show the performance results of the RIT operating iodine.