

SPACE PROPULSION SYMPOSIUM (C4)
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STUDY ON A DOUBLE PULSE DISCHARGE SOLID PULSED PLASMA THRUSTER

Abstract

Pulsed Plasma Thrusters(PPTs) are reliable, relatively simple, high specific impulse and low cost that can be used in small satellites and deep space exploration. One of the main issues with solid PPTs is low efficiency, typically about 10%. The main reason of low efficiency in PPTs is that too much neutral gas which can't be accelerated by electromagnetic field is produced during and after the main discharge. A Double Pulse Discharge Pulsed Plasma Thruster is designed base on the traditional PPTs in this paper . The energy of the PPT is distributed in two capacitors for two discharge. The secondary discharge is designed to ionized the neutral gas in the main discharge for higher efficiency. The energy distribution ratio and time interval between the two discharge are changed in the experiment to find the optimal design and achieve the match of gas feed and ionization.