SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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DEVELOPMENT OF A 10KW PROTOTYPE ION THRUSTER

Abstract

In support of the program of the deep space exploration, a 10kW prototype ion thruster was developed last year. The thruster will be used to satisfy China's Mars missions, Comet Nucleus Sample and Return, and Venus Surface Sample and Return. Compared to other thruster, the 10kW ion thruster would significantly increase the current state of the art by developing an ion engine operating at an input power of 10kW and improve the efficiency over 70% at an Isp of 4500 sec. The discharge chamber of the thruster is about 40cm diameter and it employs 4 ring-cusps magnetic schematic to produce the magnetic field to confine the plasma efficiently. The emission current of the hollow cathode is 40A. During the "discharge only" test, flat stainless grid was used. A three molybdenum domed grids assembly instead of it in beam extraction experiments. This paper describes the methodology used to design of the discharge chamber and gives the preliminary experimental results.