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Author: Mr. Le Yang

Lanzhou Institute of Physics, China, yangle_23737@sina.com

Mr. Ning Guo

China, ljf510@163.com

Dr. Yanhui Jia

China, Jiayh510@163.com

DESIGN AND PRELIMINARY CHARACTERIZATION OF A DUAL-MODE HALL THRUSTER
PROTOTYPE

Abstract

A nominally 4.5kW dual-mode Hall Effect Thruster prototype has been recently designed and built by Lanzhou Institute of Physics, with the purpose of performing an exploration and preparation for the NSSK and orbit topping mission on the GEO satellite platform which is under discussion. The thruster prototype was designed based on the well-known scaling laws which were developed in the former Soviet Union. Some optimization about magnetic design was implemented in order to enable both a high thrust and high specific impulse. The thrust was 290mN at 300V and 170mN at 400V with the efficiency of about 55%. In this paper, the magnetic design was described and its experimental tests results were compared with the FEM predictions. The cathode design and preliminary performance test data of the prototype was also included.