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Author: Dr. JIA LIU
Shanghai Institute of Space Propulsion, China, liujia7692650@163.com

Dr. Guanrong Hang
Shanghai Institute of Space Propulsion, China, hanggr@163.com

EXPERIMENTAL INVESTIGATIONS OF PLUME CHARACTERISTICS OF THE HET-40 HALL
THRUSTER BY LANGMUIR PROBE

Abstract

The plume plasma parameters mainly including plasma density and electron temperature are investigated by various Langmuir probes in the HET-40 Hall thruster classified as sub-kilowatt Hall thruster. The HET-40 thruster was developed by the Shanghai Institute of Space Propulsion (SISP) in China, which has been tested in space on the SJ-9A satellite. Here, three types of Langmuir probes, i.e., the single, double and triple probes were employed in experiment. The plasma density and electron temperature at different angles and positions were measured and it was found that the results obtained by three various Langmuir probes are basically coincident. The plasma density increases from the edge to center of the thruster and almost keeps unchanged near the axis of the thruster. And the electron temperature changes a little with the angle. In addition, some numerical results from the PIC/DSMC hybrid model were also presented and compared with the experimental results.