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Author: Mrs. jing li
China, 12345wo@sina.com

THE MICRO THRUST AUTOMATIC MEASUREMENT SYSTEM OF PLASMA THRUSTER

Abstract

We describe the micro-thrust automatic measurement system of plasma thruster in this article, The system can carry a thruster and power supply less than 2kg weight. Thrust capacity is from 0.05 to 5 mN, and thrust expend uncertainty is 0.005 mNk=2. The system is based on the torsion balance principle. The thrust of the thruster makes torque to the pivot. This torque is balanced by the electromagnetic compensate torque generated by the measurement system. The rotation angle of this system is measured by the position sensor, the electromagnetic interference signal comes from the speed sensor, the electromagnetic compensate torque is from the torque sensor. This is a closed circuit and automatic measurement system. The additional forces generated by the weight, the air supply system and the wires of the thruster have been separated from the micro-thrust in this system. The influence of deadweight, air supply system and power supply system of thruster on exact measurement of micro-thrust have been eliminated, so micro-thrust of thruster can be measured precisely and automatically .