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AN OVERVIEW OF ELECTRIC PROPULSION ACTIVITIES OF SHANGHAI INSTITUTE OF SPACE PROPULSION

Abstract

This paper provides an overview of electric propulsion research activities in Shanghai Institute of Space Propulsion (SISP) in recent years. For more than 20 years, aiming at the application demands of GEO satellites, deep space probes, LEO satellites, and manned spacecraft, electric propulsion technologies such as Hall electric propulsion, magnetoplasmadynamic thruster (MPDT), field emission electric propulsion, electrospray thruster and micro-cathode arc thruster, have been developed. From 2012 to 2014, the first in-orbit flight qualification of Chinese Hall electric propulsion system has been completed by SISP. In the field of medium power electric propulsion, Hall thrusters and Hall electric propulsion systems of 100 W class to 5 kW class have been developed. In the field of high power electric propulsion, high power Hall thruster and MPDT thruster are being developed, and a 5 kW low power steady state firing of the MPDT prototype has been carried out. In the field of micro power electric propulsion, principle prototypes of field emission electric thruster, electrospray thruster and micro-cathode arc thruster have been developed, and preliminary performance tests of these prototypes, including thrust and specific impulse measurement, have been carried out.