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LIFE TESTS OF ION THRUSTER IN LIP OF CHINA

Abstract

This paper describes the life tests of two types of ring-cusp ion thruster in Lanzhou Institute of Physics(LIP) of China. One is 1 kilowatt 20-centimeter diameter ion thruster whose life test had totaled 12000 hours, the other is 5 kilowatts 30-centimeter diameter ion thruster whose life test is now accumulated to over 3600 hours. These tests were conducted to identify life-limiting failure mode and effects of thruster design modifications, and to demonstrate operation using both power processing unit(PPU) and ground power console. Both of the ion thrusters are engineering model. The ion optics of the first ion thruster is two-grid accelerator, and for the second ion thruster is three-grid accelerator system. Performance data such as thrust, specific impulse and efficiency of the two life tests are presented. Slightly degradation of performance and isolation had occurred during both the tests. For 12000 hour test, the results of erosion rate of critical components are also illustrated in the paper.