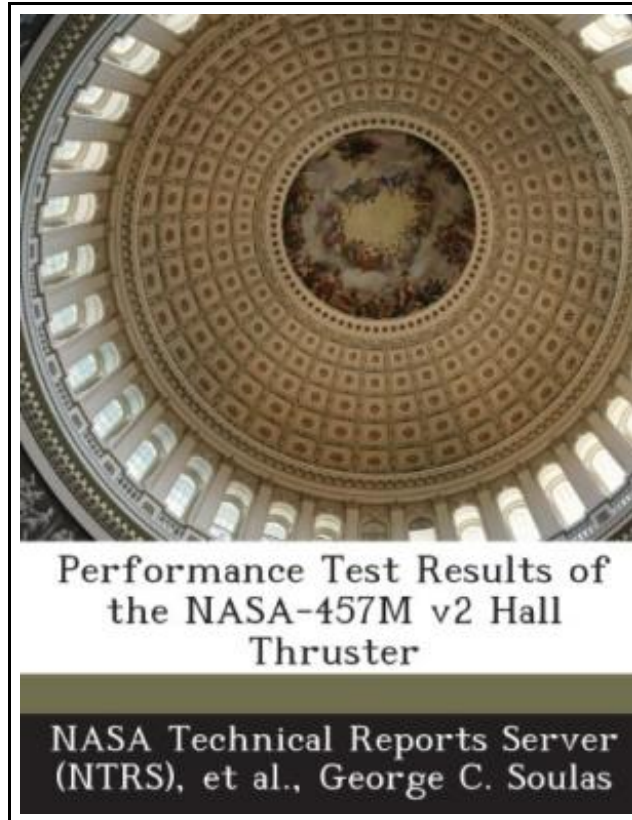


## Performance Test Results of the NASA-457m V2 Hall Thruster



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## PERFORMANCE TEST RESULTS OF THE NASA-457M V2 HALL THRUSTER



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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 30 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. Performance testing of a second generation, 50 kW-class Hall thruster labeled NASA-457M v2 was conducted at the NASA Glenn Research Center. This NASA-designed thruster is an excellent candidate for a solar electric propulsion system that supports human exploration missions. Thruster discharge power was varied from 5 to 50 kW over discharge voltage and current ranges of 200 to 500 V and 15 to 100 A, respectively. Anode efficiencies varied from 0.56 to 0.71. The peak efficiency was similar to that of other state-of-the-art high power Hall thrusters, but outperformed these thrusters at lower discharge voltages. The 0.05 to 0.18 higher anode efficiencies of this thruster compared to its predecessor were primarily due to which of two stable discharge modes the thruster was operated. One stable mode was at low magnetic field strengths, which produced high anode efficiencies, and the other at high magnetic fields where its predecessor was operated. Cathode keeper voltages were always within 2.1 to 6.2 V and cathode voltages were within 13 V of tank ground during high anode efficiency operation. However, during operation at high magnetic fields, cathode-to-ground voltage magnitudes increased dramatically, exceeding 30 V, due to the high axial magnetic field strengths in the immediate vicinity of the centrally-mounted cathode. The peak thrust was 2.3 N and this occurred at a total thruster input power of 50.0 kW at a 500 V discharge voltage. The thruster demonstrated a thrust-to-power range of 76.4 mN/kW at low power to 46.1 mN/kW at full power, and a specific impulse range of 1420 to 2740 s. For a discharge voltage of 300 V, where specific impulses would be about 2000...



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