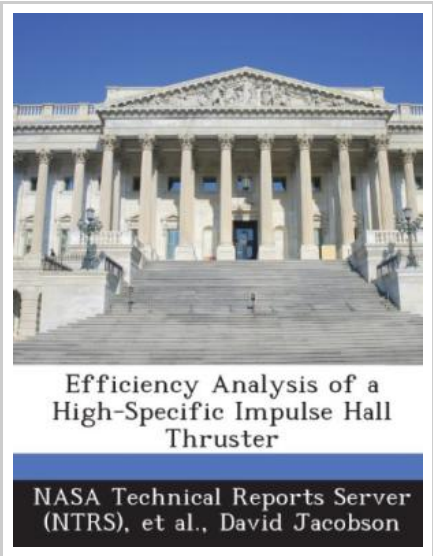

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Efficiency Analysis of a High-Specific Impulse Hall Thruster

By David Jacobson

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 26 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.Performance and plasma measurements of the high-specific impulse NASA-173Mv2 Hall thruster were analyzed using a phenomenological performance model that accounts for a partially-ionized plasma containing multiply-charged ions. Between discharge voltages of 300 to 900 V, the results showed that although the net decrease of efficiency due to multiply-charged ions was only 1. 5 to 3. 0 percent, the effects of multiply-charged ions on the ion and electron currents could not be neglected. Between 300 to 900 V, the increase of the discharge current was attributed to the increasing fraction of multiply-charged ions, while the maximum deviation of the electron current from its average value was only 5-14 percent. These findings revealed how efficient operation at high-specific impulse was enabled through the regulation of the electron current with the applied magnetic field. Between 300 to 900 V, the voltage utilization ranged from 89 to 97 percent, the mass utilization from 86 to 90 percent, and the current utilization from 77 to 81 percent. Therefore, the anode efficiency was largely determined by the current utilization. The electron Hall parameter was nearly constant with...

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Reviews

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