

SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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DEVELOPMENT STATUS OF ALTA HT-5K HIGH POWER HALL EFFECT THRUSTER

Abstract

Advantages offered by the high specific impulse of electric propulsion systems have been well recognized across the community at the extent that the use of EP is growing wider both for military and commercial space applications. Recent mission analyses have shown a need for higher power electric propulsion systems for both Earth orbit raising and deep space applications. Therefore, high power plasma propulsion systems development is being emphasized as the necessary step towards possible future missions of large satellites. Among electric thrusters, Hall Effect Thrusters (HET) offer the best compromise between thrust level and specific impulse. High power HETs have an efficiency in excess of 55

In this framework Alta developed its HT-5k Hall Effect Thruster, in order to respond to present and future market needs. Nominally operating at 5 kW, the HT-5k thruster has been tested with excellent result in the range 2.5 - 7.5 kW input power. Measured specific impulse is in the range 1700-2300s, depending on the thruster operating mode. The thruster has recently been tested also with alternative propellants (Kr and a Kr-Xe mixture) in order to assess its behaviour when fed with propellants cheaper than Xenon.

The present paper illustrates the main outcome of HT-5k experimental campaign, giving also an overview on its current development status and on the future programme perspectives.