

IAF SPACE PROPULSION SYMPOSIUM (C4)  
Electric Propulsion (1) (5)

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ATMOSPHERE-BREATHING ELECTRIC PROPULSION DEVELOPED WITHIN THE DISCOVERER  
PROJECT**Abstract**

Challenging space missions include those at very low altitudes, where the atmosphere is source of aerodynamic drag on the spacecraft. To extend the lifetime of such missions, an efficient propulsion system is required. One solution is Atmosphere-Breathing Electric Propulsion (ABEP) that collects atmospheric particles to be used as propellant for an electric thruster. The system could remove the requirement having propellant on-board and can also be applied to any planetary body with atmosphere, enabling new missions at low altitude ranges for longer times. IRS is developing, within the H2020 DISCOVERER project, an intake and a thruster for an ABEP system. The article describes the design and performance of the intake, optimized to feed the RF Helicon-based plasma thruster, and the design and tests of thruster itself.