

SPACE PROPULSION SYMPOSIUM (C4)
Interactive Presentations (IP)

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”MEPS: PROGRAMME OVERVIEW AND SYSTEM DEVELOPMENT STATUS”

Abstract

MEPS (Micro-Satellite Electric Propulsion System) is a three year programme started in late 2013, jointly supported by the European Space Agency (ESA) and the Israeli Space Agency (ISA) and aimed at the qualification of a propulsion system based on a low power, low cost Hall Effect Thruster (nominal power level 200W). The system consists of a dual thruster/cathode subsystem, a power processing unit, propellant management assembly, feeding lines and a suitable Xe tank and is conceived as a ‘plug and play’ system that can be easily installed on a number of small space platforms. It is intended to provide a prompt, effective response to the market needs, where small platforms can highly benefit from a low-cost, low-mass propulsion system. An effective solution for drag compensation, orbit maintenance, end-of-life deorbiting of LEO satellites, MEPS is going to pave the way to a new class of affordable and capable small space missions.

The programme has just entered Phase 2, where the full EM propulsion system has to be assembled and tested to verify the functionality of all the components and the compliance with the specifications defined in Phase 1. The present work describes the status of the activities, discussing the most meaningful results obtained in the initial test campaigns and presenting the next steps to reach the full qualification of the system. Initial test campaigns have been carried out separately on the thruster-cathode units and on the power processing unit (at Bread-Board level) to assess their performance. Two existing thruster concepts are being evaluated for the target system: Sitael HT100, a Hall Effect Thruster based on permanent magnets, and Rafael CAM200, a Hall thruster with an innovative topology of the magnetic field. Conceived with a design-to-cost approach, MEPS is an affordable system that can significantly extend the capabilities of mini satellites operating in Low Earth Orbit or even enable new classes of missions which are feasible only by means of electric propulsion.