

SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

Author: Prof. Mariano Andrenucci
Sitael Spa, Italy, m.andrenucci@alta-space.com

Dr. Tommaso Misuri
Sitael Spa, Italy, t.misuri@alta-space.com
Dr. Giovanni Cesaretti
Sitael Spa, Italy, g.cesaretti@alta-space.com

5 KW HALL THRUSTER PROPULSION SUBSYSTEM DEVELOPMENT AND QUALIFICATION

Abstract

This paper provides an overview of the 5 kW Hall Thruster Propulsion Subsystem development and qualification program underway at SITAEL Propulsion (formerly Alta) and SITAEL Avionics. This subsystem is aimed at supporting geosynchronous satellite applications as well as other transportation or exploration uses. This paper describes the envisaged mission scenarios, subsystem architecture, performance capabilities, program plan and current status of ongoing activities. The major elements of the propulsion subsystem, including the Hall Thruster and Cathode, the Xenon Feed System and the Power Processor Unit, are also described. The system currently under development is planned to be used for both orbit raising from an initial geosynchronous transfer orbit and on-orbit stationkeeping and repositioning maneuvers. The propulsion subsystem exploits of multi-mode capabilities and wide operating range of HT5k Hall thruster to optimize thruster utilization for each mission segment. Versions of the thruster working on alternative propellants, or incorporating life extension provisions such as magnetic shielding, being tested as a part of concurrent ESA projects, are also described.