

SPACE PROPULSION SYMPOSIUM (C4)
Missions Enabled by new Propulsion Technology and Systems (6)

Author: Dr. Carsten Scharlemann
University of Applied Science Wiener Neustadt, Austria, carsten.scharlemann@fhwn.ac.at

Mr. Nembo Buldrini
Austria, buldrini@fotec.at
Mr. Ivanhoe Vasiljevich
Austria, vasiljevich@fotec.at
Dr. Soeren Rasmussen
Sweden, soeren.rasmussen.ch@gmail.com
Dr. Tor Mortensen
Sweden, tfm@langtved.dk

ELECTRIC PROPULSION FOR THE EUROLUNA NANOSATELLITE

Abstract

In the context of the Google Lunar X PRIZE competition, aiming for a private team to put a small rover on the Lunar surface, and return video and images from the lunar surface, Euroluna has developed a nanosatellite designed to fulfill such a demanding mission scenario. Since the mission requires several radical new technology concepts Euroluna has opted for a stepwise approach. In the first step Euroluna developed a 2 kg nanosatellite (double CubeSat) in order to validate several core technologies. One of those is the propulsion system necessary to provide the required v for a transfer from LEO to the Moon. Since no commercially available propulsion system exists which is capable to deliver the required v within the stringent mass, volume, and power limitations of a nanosatellite Euroluna has commissioned the Austrian Institute of Technology (AIT) GmbH to adapt one of their FEEP based propulsion systems for the present task and provide a fully functional system ready for launch in early 2011. The adapted AIT propulsion system is capable of delivering a constant thrust range of 0.03 – 0.1 mN with an average specific impulse of ≈ 4000 s and a mass efficiency of $\approx 40\%$. The present paper provides an overview of the Euroluna efforts as well as a discussion of the development of the propulsion system. Furthermore, the paper aims at providing a first assessment of the in-space operation of the Euroluna nanosatellite and an assessment of the thruster performance and comparison with its operation during ground testing.