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20KW HALL EFFECT THRUSTER: AN ENABLING BRICK FOR SPACE EXPLORATION AND EXPLOITATION

Abstract

SITAEL is continuing the development of a 20kW Hall Effect propulsion system that can operate efficiently both with Xenon and Krypton and features a magnetically shielded thruster to considerably extend its lifetime as required by the most demanding exploration missions. The thruster, including the 60A cathode, has been designed to withstand the harsh environmental loads that are encountered during such missions, from launch to the end of the operating phase. Besides, SITAEL largest facility has been fully refurbished in 2019 in order to double the pumping capacity and test such a large thruster in a meaningful environment. All the results presented in the paper are obtained with a background pressure that is always compliant with the ECSS standards, even with mass flow rates exceeding 80 mg/s. The paper also describes the most appealing applications for this class of propulsion system, which is thought to be an enabling element for ambitious exploration programmes like the ones aiming at colonizing the cislunar region.