

SPACE PROPULSION SYMPOSIUM (C4)  
Interactive Presentations (IP)

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## PROGRESS IN CIRA DEVELOPMENT PLAN ON ELECTRIC PROPULSION

**Abstract**

Nowadays, Electric Propulsion (EP) is proposed for a large class of primary propulsion applications, such as high altitude orbit raising, orbit transfer and high impulse interplanetary scientific missions. In fact, EP systems allow cost saving of commercial and institutional satellites and to enable missions which have requirements hardly to be fulfilled by other propulsion systems. However, the development of modern high power single thrusters or clustered configurations requires huge efforts in terms of characterization and qualification phases before the integration in the space applications. Moreover, extensive investigations, due to the complex phenomena that occur on the fully deployed satellite, are needed. It is evident that the industrial development of such high power electric thrusters relies on the availability of suitable test facilities where on-orbit operations can be simulated with reliability. Given this background, CIRA intends to cooperate with the EP community providing world-class testing capabilities for high power thrusters, in order to promote Italy as the European reference point for electric propulsion testing. A plan has been drawn up in order to realize two facilities, named MSVC and LSVC, respectively. The Medium Scale Vacuum Chamber (MSVC), i.e. 2 m of diameter and 4m long, will be ready at the beginning of the 2017 in order to implement first testing capabilities and allow for the RD on engines, characterized by power up to 5 kW. In fact, CIRA development plan includes also a line aiming at designing and realizing EP engines. The first engine, to be designed and tested internally, will be a HET thruster, named CIRHET, fed-up by Xenon and characterized by a nominal power and thrust equal to 250 W and 11 mN, respectively. Moreover, for the mid-term period, the CIRA intends to integrate its testing capabilities, by realizing a world-class test facility, the Large Scale Vacuum Chamber (LSVC). The facility, a 8m-diameter and 16m-long space simulator, will be ready by 2018 and it will include advanced diagnostics systems and EMC-EMI chamber. The present paper gives an overview of CIRA development plan on EP with the first achieved goals.