Contribution ID: **20** Type: **talk**

Progress and Developments in Open Source Electric Propulsion at Applied Ion Systems

Saturday, 12 December 2020 15:15 (20 minutes)

The state-of-the-art in the field of open source space technologies has continued to progress rapidly in recent years. While significant advances have been made, there are several key areas where accessibility remains a challenge. One of these critical areas requiring further focus on in the open space hardware area is that of propulsion, which still remains prohibitively expensive for most nanosat and picosat teams, and with often high complexity and incomplete design details in academic literature, further increases the barrier of entry for development. Electric propulsion technologies in particular offer unique advantages specifically for Cubesat and smaller class satellites for a wide range of applications, from attitude control, to debris avoidance, station keeping, and other orbital maneuvers.

Since the development of the first fully integrated open source micro-PPT at Applied Ion Systems (AIS) last year, the AIS-gPPT3-1C, currently aboard the AMSAT-Spain GENESIS N and L PocketQubes, several new prototype systems have been tested through the AIS effort. These systems include new variations on the gPPT3 thruster design, as well a new PPT design, an ionic liquid ion source (ILIS) electrospray thruster, and further research into additional higher-power conventional technologies such as RF gridded ion thrusters, RF plasma thrusters, and micro-resistojets. AIS is also currently engaged in R&D of new highly experimental propulsion systems and alternative fuels for plasma and ion thrusters, covering a range of satellites from PocketQubes to large Cubesats and beyond, in power classes ranging from a few Watts to hundreds of Watts and up. The goal of these developments are to provide the community with a way to access these exciting technologies, allowing for them to further expand mission capabilities, while radically reducing the cost of development and systems as a whole.

For prior developed systems, current designs in testing, and new future designs in the works, AIS has also adopted the new CERN Open Hardware License V2 for releasing design files to support its mission for open source electric propulsion.

Primary author: BRETTI, Michael (Applied Ion Systems)

Session Classification: Room #1