

IAF SPACE PROPULSION SYMPOSIUM (C4)
Interactive Presentations - IAF SPACE PROPULSION SYMPOSIUM (IP)

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MAGNETICALLY LEVITATED TEST STAND FOR THRUST MEASUREMENT FOR MICRO
PROPULSION SYSTEMS

Abstract

The rapid development of CubeSats in the current industrial revolution is a clear result of their expanding applications across a wider range of organizations, including governmental, educational, and private entities over the past decades. This growth is continuing and has facilitated the spread of space science and technology to a wider audience beyond the purview of limited few. As a result, CubeSat has become an accessible and affordable way for various research groups and institutions to engage with space science, hence driving innovation and expanding our understanding of the universe. The expansion of the CubeSat industry can be attributed to the widespread availability and affordability of the technologies and components used in the industry.

The advent of micro/nano electronics and advanced materials has enabled new space/LEO capabilities for mission designers that otherwise not achievable. In particular, there are emerging and critical needs to develop high-performance micro propulsion thrusters that can be integrated with CubeSat platform. These thrusters are expected to have the thrust level at mN and Isp at about few hundreds to thousands, depending on the make of thrusters. However, one of the key challenges of developing such a thruster is the ability to accurately measure its thrust output and characterize its performance. In this study, a novel and cost-effective test stand will be designed and developed to address such challenge. The results will offer high precision in thrust measurement for micro propulsion systems.