

SPACE PROPULSION SYMPOSIUM (C4)
Poster Session (P)Author: Mr. Roberto Dextre
United States, robertdextre@gmail.comINTEGRATION CONSIDERATIONS IN SATELLITE PROPULSION SYSTEMS: HALL THRUSTERS
VERSUS ION ENGINES**Abstract**

Current satellite propulsion systems are utilized to control the position and attitude of orbiting spacecrafts. A satellite experiences small forces while traveling in our solar system; therefore, it is necessary to counteract any force that causes the satellite to tumble or go off its projected path. Common satellite propulsion systems including ion propulsion devices, such as Hall Effect thrusters or ion engines, are utilized for this purpose. An analysis is done to accurately determine the reliability of these propulsion devices corresponding to its mission and payload. This analysis is conducted by reviewing previous designs of ion and Hall thruster devices and understanding the performance, specific impulse, lifetime, power consumption, and etc. With this knowledge, aspects such as failure rates in Reliability Engineering can be determined and be implemented to increase the probability of a successful mission. These concepts are also reviewed to determine the advantages and disadvantages of a Hall thruster to an ion engine following the same rubric used to determine its reliability. Modern electric propulsion systems are accounted for and the growth of spacecraft power over time in history is analyzed. This research will lead to a deeper understanding on the operations of ion propulsion systems and its progression over time. Results from this research can provide insight on the best approach to improve and develop these devices. The development of these systems over history can also bring future considerations for more powerful electric propulsion systems.