

66th International Astronautical Congress 2015

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Future Space Transportation Systems Technologies (5)

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IODINE PROPULSION ADVANTAGES FOR LOW COST MISSION APPLICATIONS

**Abstract**

The exploration of alternative propellants for Hall thrusters continues to be of interest to the community. Investments have been made and continue for the maturation of iodine based Hall thrusters. Iodine testing has shown comparable performance to xenon. However, iodine has a higher storage density and resulting higher  $V$  capability for volume constrained systems. Iodine's vapor pressure is low enough to permit low-pressure storage, but high enough to minimize potential adverse spacecraft-thruster interactions. The low vapor pressure also means that iodine does not condense inside the thruster at ordinary operating temperatures. Iodine is safe, it stores at sub-atmospheric pressure, and can be stored unregulated for years on end; whether on the ground or on orbit. These characteristics make iodine an ideal propellant for secondary spacecraft. A range of missions have been evaluated for direct comparison of Iodine and Xenon options with a focus on low-cost mission applications. The results show advantages of iodine Hall systems with significant cost savings over state-of-the-art alternatives.