SPACE PROPULSION SYMPOSIUM (C4)
Electric Propulsion (4)

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ADVANCEMENT OF A 30 KW SOLAR ELECTRIC PROPULSION SYSTEM CAPABILITY FOR NASA HUMAN AND ROBOTIC EXPLORATION MISSIONS

Abstract

Solar Electric Propulsion (SEP) has evolved into a demonstrated operational capability performing station keeping for geosynchronous satellites, enabling challenging deep space scientific missions, and assisting in the transfer of satellites from an elliptical orbit Geostationary Transfer Orbit (GTO) to a Geostationary Earth Orbit (GEO). Advancing higher power SEP systems will enable numerous future applications for human, robotic, and commercial missions. These missions are enabled by either the increased performance of the SEP system or by the cost reductions when compared to conventional chemical propulsions systems. Higher power SEP systems that provide very high payoff for robotic missions also trade favorably for the advancement of human exploration beyond low Earth orbit. Demonstrated reliable systems are required for human space flight and due to their successful present day widespread use and inherent high reliability, SEP systems have progressively become a viable entrant into these future human exploration architectures. The NASA studies have identified a 30 kW-class SEP capability as the next appropriate evolutionary step applicable to wide range of both human and robotic missions. This paper describes the planning options, mission applications, and technology investments for a representative 30 kW-class SEP mission presently being planned by NASA.