SPACE PROPULSION SYMPOSIUM (C4)
New Missions Enabled by New Propulsion Technology and Systems (6)

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STUDY ON THE ENGINEERING APPLICATION PROBLEMS OF ELECTRIC PROPULSION SYSTEM FOR ASTEROID EXPLORATION MISSIONS

Abstract

Deep space exploration is the exploration activities carried out by the launch of the spacecraft on the celestial body other than Earth. Since there is various deep space exploration forms, spacecraft requires high maneuvering ability, thus high propulsion performance. The specific impulses of traditional chemical propulsion systems is approximated 320 seconds, cannot meet the demand of delta velocity of some deep space exploration mission. Electric propulsion system is a novel propulsion system that accelerates charged particles using electrical energy. It can accelerate charged particles to very high speed, thus acquires high specific impulse. Application of electric propulsion system on deep space exploration spacecraft can greatly reduce fuel consumption, and offer high delta velocity. There are two kind of electric propulsion systems, hall electric propulsion system and ion electric propulsion system. They are very suitable for the subsequent deep space exploration missions. However, it's still facing a lot of engineering problems to apply electric propulsion technology to deep space exploration, such as the thruster plume effects, EMC problems, life and reliability problems. This paper focused on the engineering problems of the application of electric propulsion in deep space exploration, and proposes solving approaches. It will provide some reference significance to the application of electric propulsion in deep space exploration of China.