

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

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STUDY OF MAGNETO-PLASMA DYNAMIC THRUSTER SYSTEM

Abstract

The privatization of the space sector in many countries elicited many companies to think about the concept of interplanetary travel for space exploration. Although we are having a good amount of data from some past missions, today we are lacking the type of propulsion system which can take us beyond the moon efficiently. In this paper the technology which is demonstrated uses a plasma thruster in place of conventional method of propulsion. A Magneto Plasma Dynamic Thruster is the most powerful electrically operated space propulsion system which uses the force on a charged particle due to electromagnetic field also known as Lorentz force, the gaseous fuel used in the designed thruster is Lithium. The input power is kept 100W, the length of the acceleration chamber is designed using an iterative solution for finding the most optimal length for the given amount of electromagnetic forces in the acceleration chamber and required thrust which is targeted to be in between 2-2.5 Newtons. The research is intended to make the Magneto Plasma Dynamic thruster a main propulsion system for heavy cargo and piloted vehicles.