

Interactive Presentations (IP)
Topic 7 - Interactive Presentations (7)

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ON THE ROLE OF MICROWAVES IN PLASMA GENERATION FOR ELECTRO-CHEMICAL
THRUSTERS

Abstract

Space propulsion demands expulsion of exhaust gases at very high velocity pooled with very low propellant consumption. Electric propulsion is widely known to achieve high speeds over long periods and work better than chemical systems for deep space missions. The present work focuses on fundamental concept of supersonic transportation by amalgamation the two diverse modes of propulsion. This configuration is very likely to have significant implications on flow features which can be controlled for required output. The requisite of electric propulsion is to generate plasma (high temperature ionized gases) and expansion at high speed. The interaction of combustion products with microwaves unifies to a plasma state which is further accelerated to high velocities in the nozzle. We systematically investigate microwaves as an effective and attractive option for plasma generation with content. The condition for plasma generation of combustion products is with vital parameters like optimal frequency range and intensity is functioned out along with the role of key controlling parameters. The results are compared with alternate options of radio waves, heavy D.C voltage drop, and formation of arc. It is expected that benefits of electric propulsion can minimize the loopholes in simple chemical propulsion. At present, organised study is being carried out to thoroughly observe the effects of microwaves on flow features and to originate an optimal design with much better features and control.