

IAF SPACE PROPULSION SYMPOSIUM (C4)
Disruptive Propulsion Concepts for Enabling New Missions (9)

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FEASIBILITY OF HYBRID PHOTONIC PROPULSION TECHNOLOGY(HOPT) FOR FUTURE
SPACE MISSION**Abstract**

Each year multiple spacecrafts are sent to space on a global level and it has helped mankind achieve great endeavors. But in terms of moving towards the interplanetary space, no other satellites except NASA's Voyager 1 and Voyager 2 have become the most distant spacecrafts. It took Voyager 1, 35 years to cross the heliopause. Though these spacecrafts were unmanned, there is a possibility for the future missions to involve humans to move towards the interplanetary space. This would require spacecrafts with complex payloads. To make such missions successful, it would require advanced technological improvements to enhance the engine's power by either thrust or specific impulse. This paper provides an approach to hybrid photonic propulsion technology (HOPT), which is designed for improved specific impulse using proprietary optical nozzle thruster technology that is designed with simplicity and mass-manufacturability in mind. Moreover, the objective of these photonic thrusters is to meet the challenge of new space race's mega constellations. Further, the research mainly focuses on four aspects of optical propulsion: 1. optics propeller and source; 2. multiple grating optical nozzle; 3. feasibility; and 4. usage for a cube satellite as a demonstration with 10 W electrical power usage.

Keywords: Space Optics, hybrid optical propulsion technology(HOPT), optical propellant atom, electron bombardment, Grating, Phased Array Propeller, Cube-satellite, Multiple Wide-band Photonic Source