

# "Mini-Magnetospheric Plasma Propulsion: Tapping the energy of the solar wind for spacecraft propulsion"

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## **Abstract**

Min-Magnetospheric Plasma Propulsion is a potentially revolutionary plasma propulsion concept that could enable spacecraft to travel out of the solar system at unprecedented speeds of 50-80 km s<sup>-1</sup> or could enable travel between the planets for low power requirements of ~1kW per 100 kg of payload and ~0.5kg fuel consumption per day for acceleration periods of several days to a few weeks. The high efficiency and specific impulse attained by the system are due to its utilization of ambient energy, in this case the energy of the solar wind, to provide the enhanced thrust. Coupling to the solar wind is produced through a large-scale magnetic bubble or mini-magnetosphere generated by the injection of plasma into the magnetic field supported by solenoid coils on the spacecraft. This inflation is driven by electromagnetic processes, so that the material and deployment problems associated with mechanical sails are eliminated.

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