

# Liquid-Fed Pulsed Plasma Thruster for Propelling Nanosatellites

**A novel micro liquid fed pulsed plasma thruster offers increased efficiency and lifetime for nanosatellites and CubeSats by eliminating the need for a propellant feed mechanism.**

Researchers at Purdue University have developed a liquid fed pulsed plasma thruster (LF-PPT) for use in nanosatellites. Contemporary solid/gas phase propellants have been employed with limited success in nanosatellites, stemming from low efficiencies, limited operational lifetime, contamination issues, and complex/bulky injection systems. To remediate these disadvantageous qualities and make thruster systems more applicable to nanosatellite designs, this technology presents a novel micro LF-PPT propulsion system comprised of a pulsed plasma accelerator and a low-energy surface flashover igniter. No propellant feed mechanism is needed with this design, making it beneficial for nanosatellite application due to their volumetric constraints. Pentaphenyl trimethyl trisiloxan was used as a propellant for testing parameters of the system including igniter breakdown, plasma dynamics, and exhaust velocity.

## **Advantages:**

- Increased efficiency
- Smaller sized propulsion system
- Increased lifetime
- "Green" propulsion system

## Potential Applications:

- Nanosatellites
- CubeSats

**TRL: 3**

## **Intellectual Property:**

## **Technology ID**

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## **Category**

Aerospace & National  
Security/Space Technologies  
Aerospace & National  
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Propulsion Systems

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