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## **BeamPIE – a suborbital test of an accelerator for space applications**

*Friday 6 June 2025 12:00 (30 minutes)*

**Summary:** An experiment to fly an accelerator in space recently concluded successfully. Discuss the objectives, differences from terrestrial accelerators, and results from the flight.

Accelerators have the potential to play a major role in space-based activities. These can range from investigation of the Earth's magnetic field, to helping mitigate the effects of increased solar activity (e.g. by helping drain the Earth's radiation belts of charged particles), to deep-space missions. There are many challenges associated with operating accelerators in a space-based environment, however, ranging from high-voltage systems, to thermal management, to spacecraft charging. The Beam-Plasma Interaction Experiment –BeamPIE –was a small electron accelerator launched on a sounding rocket in 2023, to both explore the interaction of an electron beam with the near-earth plasma environment, and to test several new approaches to accelerator design in a space environment. This talk presents an overview of the BeamPIE accelerator design, mission objectives, and results from its flight.

### **Footnotes**

### **Funding Agency**

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