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Miniature Plasma Imager: A new tool for in situ ionospheric and auroral investigations from nanosatellites

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Development has commenced at the University of Calgary on a prototype next-generation ion imager called the Miniature Plasma Imager (MPI). The work is being performed under contract to the Canadian Space Agency as part of its Space Technology Development Program. The Miniature Plasma Imager is designed to be an smaller Thermal Ion Imager, which is the sensor used on the Swarm Electric Field Instrument to measure ion drift and temperature in the F region ionosphere. Having similar ion focusing optics, MPI replaces the high-voltage (5 kV to 8 kV) TII electro-optical detector with an ion-sensing IonCCD(TM) running at 24 V. We present an overview of the new instrument, describe its anticipated measurement performance (velocity resolution and accuracy), and discuss its application to multi-point ionospheric and auroral physics studies using nanosatellite (<10 kg) orbital platforms.

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