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A novel low-mass, wide field-of-view UV auroral imager employing a spherically-slumped MCP optic

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We present the design concept and initial results for a novel UV auroral imager. A square pore spherically-slumped microchannel plate optic, with a radius of curvature of 70 mm and a pore size of 85 microns, provides a focal length of 35 mm and a field-of-view of approximately 40°. Experimental data are compared with detailed ray-trace simulations, and we demonstrate an angular resolution of 2.8° for the prototype. The latter translates to a spatial resolution of 40 km x 40 km when imaging from an altitude of 800 km; a desired resolution of 25 km x 25 km is thought to be easily attainable with optimized MCPs. The final instrument is envisaged to have a mass of 2.5 kg and a power consumption of 15 W. A mosaic of such units could provide a very wide field-of-view for imaging the whole auroral oval from low altitude.