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A selection of results from e-POP RRI polarimetry experiments

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Since the outset of science operations with the Enhanced Polar Outflow Probe (e-POP) Radio Receiver Instrument (RRI) in September 2013, over 100 conjunctions with Super Dual Auroral Radar Network (SuperDARN) radars have been completed. With the cross-dipole configuration of RRI's four monopole antennas, and the receiver's high sampling rate, it is possible to determine the polarization state of an individual SuperDARN pulse incident on the receiver. The SuperDARN Saskatoon system transmits a linearly polarized radar pulse which can become separated into packets of elliptically polarized O- and X-mode polarization states as the pulse propagates through to the birefringent ionosphere. Therefore, the full analysis of a SuperDARN pulse may require resolving its O- and X-mode components. We present the results from a selection of e-POP RRI polarimetry experiments with the SuperDARN Saskatoon system, and compare them to past theoretical predictions. The importance of the geometry of an experiment to the resulting polarization measured is discussed.

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