SESSION: SWARM, ePOP

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Modeling SuperDARN Saskatoon's radiation pattern in an empirical ionosphere

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Measurements from coordinated experiments between the Swarm-E Radio Receiver Instrument (RRI) and Super Dual Auroral Radar Network (SuperDARN) systems, including the radar at Saskatoon, suggest that SuperDARN transmissions may undergo significant deviations beyond their expected great circle path trajectories. These results may have important implications for our understanding of high frequency (HF) radio wave propagation in the auroral and polar regions and may be used to gain insight into the prevalence and repercussions of plasma density structures therein. However, it is difficult to distinguish between expected and unexpected features in RRI's measurements of SuperDARN radars since a model of their radiation patterns in the terrestrial ionosphere does not exist. Therefore, we have developed a model of SuperDARN Saskatoon's radiation pattern propagated through an empirical ionosphere. We describe the details of the model, demonstrate its application, and present initial validation results using RRI data. We will also discuss how the model may be used as a tool for interpreting SuperDARN data.