



## **Energetic particle precipitation occurrence rates determined using the Super Dual Auroral Radar Network**

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We demonstrate that the Super Dual Auroral Radar Network (SuperDARN) can be used to detect energetic particle precipitation (EPP) events by observing high frequency radio wave attenuation in the D region ionosphere. The radars can detect polar cap absorption during solar proton events, as well as weaker ionisation associated with substorms and pulsating aurora. Energetic electron precipitation occurrence rates over Syowa Station, Antarctica have been determined as a function of magnetic local time (MLT) using a database of 555 events identified in 2011. The post-midnight and morning sector occurrence rates were found to exhibit significant seasonal variations. The SuperDARN dataset consists of more than 20 years of continuous observations covering sub-auroral, auroral and polar latitudes. This provides a new opportunity to determine long-term EPP occurrence rates for use in studies of the atmospheric effects of particle precipitation.