



## **The radiation belt slot region: A source of energetic electron precipitation in the southern hemisphere polar vortex.**

Andrew J. Kavanagh

British Antarctic Survey, Cambridge, United Kingdom (andkav@bas.ac.uk)

Energetic electron precipitation at mid-magnetic latitudes in the southern winter hemisphere has the potential to influence regional climate variability. The offset of the magnetic pole in the southern hemisphere means that the footprint of the radiation belt slot region crosses the polar vortex; during large geomagnetic storms the slot region can be filled by electrons, some of which precipitate into the atmosphere. Energetic electron precipitation changes the ion chemistry, generating species that impact the heat balance of the middle atmosphere and potentially influencing regional climate variability when transported in the polar vortex. Energetic precipitation also leads to increased ionization in the mesosphere, which in turn attenuates high frequency radio waves that pass through the region. We present observations of the attenuation of a transmitted signal at 1.98 MHz under the footprint of the radiation belt slot-region during large geomagnetic storms. Measurements from the polar orbiting NOAA POES satellites indicate that the slot-region is being filled by electrons at these times. These observations indicate that the slot region is a source of precipitation that has the potential to impact on the heat balance of the middle atmosphere and below.