



Electron precipitation spectra during different types of pulsating aurora (PDF)

Pulsating aurora (PsA) is irregularly structured diffuse aurora, which primarily occurs in the morning sector of the auroral oval and during substorm recovery phases. PsA is known to associate with energetic electron precipitation, which can ionise the height region of upper mesosphere -- lower thermosphere at about 80-100km. PsA has recently been categorised into Amorphous, Patchy and Patchy Pulsating aurora. Amorphous PsA is very transient and seem to relate to less energetic electron precipitation, which may not contribute towards mesospheric ionisation, while the other two PsA types are accompanied by high-energy electron precipitation with much stronger role in the ionisation of the bottom part of the ionosphere. Detailed contribution of the different PsA types to the ionisation of the mesospheric region is, however, an unanswered question. This project will thus use known and pre-categorised PsA events together with low-altitude spacecraft measurements of electron precipitation to characterise electron precipitation spectra for the three different PsA types separately. Because ionisation in this height region of 80-100km leads to chemical changes, will the results from this project have an importance in future studies of neutral atmospheric chemical changes during PsA.

Indirect classification of electron energy during PsA types:

<https://angeo.copernicus.org/articles/38/1191/2020/>