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Changes in proton precipitation in the region of the cusp and in a related transpolar arc

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Emissions from hydrogen resulting from proton precipitation were measured from the ground at Svalbard by the Specrographic Imaging Facility (SIF) in the Balmer-beta line. These are placed in the large-scale context of proton precipitation over the whole polar cap region using the spectrographic imager SI12 on the IMAGE spacecraft which measures hydrogen emission in the Lyman-alpha line. Following a period of exceptional solar activity, with eruptions of four CMEs within 18 hours on 24-25 November 2000, the solar wind Parker spiral was severely distorted. This resulted in many signatures of these effects being measured in the northern auroral ionosphere over the following days. In particular, during a time of high solar wind number density on 27 November 2000, and following abrupt changes in solar wind magnetic field direction, a region of hydrogen emission was measured over Svalbard close to magnetic noon, which moved and varied in intensity in response to these changes. A pass of the DMSP F12 spacecraft over Svalbard provides particle spectra to use as input to modelling of the hydrogen emission line measured from ground, and to validate the changes in energy spectra of the precipitating protons throughout the event. This result is combined with the large-scale processes that are measured both by the IMAGE spectrograph and by the SuperDARN radars. A transpolar arc formed from the nightside to the region of emission measured from the ground over Svalbard. We will analyse the motion on the transpolar arc in relation to the solar wind conditions and the ongoing dayside and nightside reconnection processes.