



## **Dynamical polar cap boundary during substorms**

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The energy storage in the magnetotail lobes and release during substorm activations is associated with changes in the polar cap boundary (PCB) location in the ionosphere. We have studied the location of the nightside PCB in several events by the EISCAT radars. The PCB motion is highly dependent on the MLT studied. When the localised EISCAT measurements were made within the substorm onset region, dynamical behaviour of reconnection was seen with bursts of 2-10 min. In another event, the PCB location fluctuated with a period of 30 min during late substorm expansion and recovery. Conjugate Cluster pass at a distance of 4 Re indicated that the PCB can show sudden temporal changes still during substorm recovery. A poleward leap of 2 deg was observed. Finally, estimation of the tail reconnection rate is discussed. The reconnection rate can be calculated, if the vector plasma velocity and the polar cap boundary orientation are known. This kind of an estimate has been done with the dual-beam EISCAT VHF radar and the results are discussed together with equivalent east-west electrojets and optical measurements of the oval by a satellite.