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Auroral electron fluxes and characteristic energy of precipitating electrons inferred by ALIS and EISCAT

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Auroral electron fluxes are retrieved by two different methods: firstly from inversion of EISCAT-observed electron density profiles and secondly from inversion of the N_2^+(4278Å) band auroral emission profile reconstructed from observations with the Auroral Large Imaging System (ALIS) in Scandinavia. Coordinated campaigns took place in March 2008 and provide a unique opportunity to study the characteristics of the evolution of an auroral arc.

A bright and stable arc on 05 March 2008 is presented as a case study. Characteristic energies of the precipitating electrons are inferred from ALIS observations both across and along the arc. Where EISCAT is observing, i.e., along the magnetic field line, the retrieved characteristic energies are in good agreement. The arc width and its dependence with auroral emissions (either O I 6300, 5577, 8846Å and N_2 II 4278 Å) are also discussed in light of transport kinetic simulations such as TRANS4 (Simon et al., 2007).