

## Study on electrodynamics of black auroras based on simultaneous EISCAT and high-resolution TV observations

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Black aurora is a relatively small region of lack of emissions, in a diffuse aurora or between diffuse and discrete auroras. It is supposed to be a fundamental process of the magnetosphere-ionosphere (M-I) coupling. Not many works based on observations have so far been conducted about the black aurora (e.g., Toronsen and Cogger, JGR, 102, 363, 1997) and hence its physical characteristics have not yet been understood well. The present study aims at understanding the electrodynamics of the M-I coupling associated with the black aurora, in particular, from the viewpoint of observations in the ionosphere with EISCAT measurements. In this talk, we will present a preliminary result from a simultaneous EISCAT-optical campaign for February 28 -March 5, 2003. In this campaign, the EISCAT UHF radar at Tromsø will look at the magnetic field-aligned direction and observes physical parameters such as ion and electron temperatures, electron density and ion velocity. By combining ion velocity data from two remote sites, we can derive E-field as well. A low-light and high resolution TV camera, two digital camera, and a fixed-angle (along the local magnetic field line) multi-wavelengths photometer will be operated during the campaign. Based on these observations, we will show how the ionosphere changes associated with black auroras.