

R005-27

A 会場 : 11/27 PM1 (13:45-15:45)

15:00~15:15:00

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(¹IRF)

Electric fields in and around auroral arcs at higher F region using BROR experiment data

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In March 2023, the Barium Radio and Optical Rocket (BROR) experiment was conducted at the Esrange rocket range near Kiruna, Sweden. The payload included eight canisters containing Ba-Sr-thermite mixtures, released at altitudes between 130 and 250 km. This BROR experiment carried out simultaneous ground-based optical and radar observations.

ALIS_4D multistation auroral imager system operated by the Swedish Institute of Space Physics (IRF) was a crucial optical facility that supported the BROR experiment. During the experiment, the five ALIS_4D stations operated at Kiruna, Abisko, Silkkimuotka, Tjautjas, and Esrange. The multi-point optical observations allow the 3D tomography reconstruction of the artificial ion clouds. Additional observations included NIPR cameras, IRF all-sky cameras, and photos and movies provided by many semi-professional photographers. Simultaneous EISCAT UHF radar observations were also performed.

In the auroral ionosphere, the ion motion is determined primarily by the electric field. Therefore, the barium ion dynamics obtained from the tomography reconstruction allowed us to determine the ionospheric electric field.

During the BROR experiment, natural aurora was also present, and the motion of the barium ion clouds crossing the aurora was observed. The analysis of these data allows us to derive the electric field dynamics in the vicinity of the active auroral arc.

In this presentation, we report electric fields inside and outside of the auroral arc calculated at the F-region altitudes of approximately 230 km using data from the BROR experiment.