

カusp領域でのバリウム・ストロンチウムを用いた熱圏風・プラズマドリフト計測

柿並 義宏 [1]; 渡部 重十 [2]; 山本 真行 [3]; 木原 大城 [3]; Conde Mark[4]; Larsen Miguel[5]
[1] 高知工科; [2] 北大・理・宇宙; [3] 高知工科大; [4] アラスカ大フェアバンクス校; [5] Clemson Univ.

Measurements of thermospheric wind and plasma drift by using Barium and Strontium release in the cusp region

Yoshihiro Kakinami[1]; Shigeto Watanabe[2]; Masa-yuki Yamamoto[3]; Daiki Kihara[3]; Mark Conde[4]; Miguel Larsen[5]
[1] Kochi Univ. of Tech.; [2] CosmoSciences, Hokkaido Univ.; [3] Kochi Univ. of Tech.; [4] University of Alaska Fairbanks; [5] Clemson Univ.

Neutral density observation by CHAMP satellite showed enhanced anomaly in the cusp region. However, the mechanism of the anomaly is still controversial issue. Neutral wind and plasma drift are a key to understand the mechanism. Last decade, chemical release experiments using Lithium have been successfully done and the data contribute to understand neutral wind in the thermosphere in middle latitude. However, since Lithium (Li) is not ionized well, neutral wind is only detectable by using Li. Therefore, gases which are ionized in a short time are required to detect plasma drift. In order to detect both neutral wind and plasma drift, Barium (Ba) and Strontium (Sr) were employed for the rocket experiment which was named the Cusp Region Experiment (C-REX). After Ba are ionized, Ba⁺ is resonantly scattered with 455.4. Further, neutral Ba and Sr are resonantly scattered with 553.5 460.7 nm, respectively. To detect the resonant scattering, we set up 2 camera with band-pass filters for Ba and Ba⁺/Sr for each site at Longyerben and Ny-Ålesund, Norway. Moreover we set up a camera with a grating to observe spectrum. The rocket was successfully launched from Andoya, Norway at 08:05 UT of 24 November 2014 and first chemical release was observed at 08:14:19 UT from Longyerben, Ny-Ålesund and an airplane. Ten of 24 canisters were successfully ignited between 200 and 400 km altitude at about 600 km away from Svalbard islands. Resonance scatterings were observed by digital cameras with filter and video as well as human eyes. In this paper, we report velocity of neutral wind and plasma drift, spectrogram of Ba and Sr and time series of intensity of the luminance.