

Coordinated Arase (ERG) satellite and EISCAT radar observations

Yasunobu Ogawa[1]; Yoshizumi Miyoshi[2]; Kazuo Shiokawa[3]; Keisuke Hosokawa[4]; Shin-ichiro Oyama[2]; Antti Kero[5]; Satonori Nozawa[6]; Kanako Seki[7]; Yoshimasa Tanaka[8]; Takeshi Sakanoi[9]; Iku Shinohara[10]; Yukinaga Miyashita[11]; Ryoichi Fujii[12]; Hiroshi Miyaoka[1]; Akira Kadokura[1]; Kazushi Asamura[13]; Yuto Katoh[14]; Yoshiya Kasahara[15]; Hirotsugu Kojima[16]; Ayako Matsuoka[17]; Satoshi Kurita[2]; Shoya Matsuda[2]
[1] NIPR; [2] ISEE, Nagoya Univ.; [3] ISEE, Nagoya Univ.; [4] UEC; [5] SGO, Univ. Oulu; [6] ISEE, Nagoya Univ.; [7] Dept. Earth & Planetary Sci., Science, Univ. Tokyo; [8] NIPR/SOKENDAI; [9] Grad. School of Science, Tohoku Univ.; [10] ISAS/JAXA; [11] KASI; [12] STEL, Nagoya Univ.; [13] ISAS/JAXA; [14] Dept. Geophys., Grad. Sch. Sci., Tohoku Univ.; [15] Kanazawa Univ.; [16] RISH, Kyoto Univ.; [17] ISAS/JAXA

We report collaborative study of the Magnetosphere-Ionosphere coupling based on coordinated observations of the Arase (ERG) satellite and EISCAT radars. The coordinated observations have been discussed and summarized as a white paper which includes study targets of (1) characteristics and generation mechanisms of chorus waves and pulsating aurora in the morning sector, (2) oxygen ion outflow from polar ionosphere and energetic particle injection by substorm dipolarization in the nightside sector, and (3) EMIC waves and their relation to proton precipitation in the evening sector.

After Arase satellite started normal observations in March, 2017, eighteen simultaneous observations in the morning and nightside sectors have been carried out with the EISCAT Tromsø UHF/VHF radars and Arase satellite so far. Eight conjunction events in the simultaneous observations show enhanced ionization in the E/D region ionosphere due to hard energy particle precipitation from the magnetosphere. The EISCAT observations for the collaborative study have been conducted as a combination of Japanese and Finnish special programs (SP), peer-review program (PP), and special programs of all EISCAT associations (AA). These data have been processed to make CDF format files, and integrated with other related dataset.

In this paper, we will introduce overview of the Arase-EISCAT observations based on the white paper, and discuss further international collaboration plans between Arase and EISCAT radar projects.