[EE] Evening Poster | P (Space and Planetary Sciences) | P-CG Complex & General

[P-CG21]Future missions and instrumentation for space and planetary science

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Mon. May 21, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe) Not only national space agencies but some universities and even companies in the world are now leading a number of space science and exploration missions and also energetically initiating new research activities for satellite and rocket developments and international collaborations in these days because the Earth observations from the space and the space explorations could be achieved much easier than a few decades ago. The deployment to the space, which itself is not purely a scientific purpose but one of methods for better sciences, is vigorously motivating the technical innovation and the educational development. For successful space missions, it is also crucial to research and develop aim-oriented onboard instruments, and the fundamental research and development of observational instrumentation with future perspectives could totally lead space missions in some case. Detailed investigation and evaluation on various on-board instruments are needed during their proposals, selections, and fabrications in order to promote the missions, and inevitably we have to make multi-sided arrangements and evolution at every process and aspect of any type of space missions, independently of their mission sizes. In this session, we focus on these comprehensive research activities in the space missions, including the mission integrations and the individual instrumental developments, and we also call many presentations showing the uniqueness and renovation regarding the mission strategy and methodology, and the status and latest results in the related state-of-the-art researches and developments, which would provide all of researchers and developers with invaluable opportunities for active discussion, information sharing, and collaboration toward the realization of more missions for more fruitful space sciences and explorations in nearer future.

[PCG21-P07]Development of an auroral electron analyzer for RockSat-XN rocket mission

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In the Earth's magnetosphere, relativistic-energy (>MeV) electrons are trapped in the region called radiation belt. It is well known that these high-energy electrons rapidly drop out during the geomagnetic storm main phase, but the physical mechanism to be responsible is not exactly known. Although several hypotheses are proposed, they have not been well quantified. Therefore it is unclear which is the major cause of the loss of the radiation belt electrons.One candidate is the electron precipitation by pitch angle scattering via cyclotron resonance with whistler mode chorus waves. In order to evaluate this mechanism quantitatively, the amount of precipitating high energy electrons should be measured. Nevertheless, in the magnetosphere, where the scattering occurs, it is difficult to identify precipitating electrons because of the small size of the loss cone. On the other hand, in the ionosphere, where the precipitating electrons can be directly measured, it is not easy to identify chorus waves that correspond to the precipitating electrons, since chorus waves do not propagate in exactly parallel to the geomagnetic field, and not always reach the ionosphere with the sufficient intensity. Here we suggest another method, to observe the pulsating aurora (PsA) in the ionosphere instead of the chorus waves, since this type of aurora is driven by chorus wave in the magnetospheric equator. In order

to put this idea into practice, we are planning to launch some instruments onboard RockSat-XN rocket into a PsA in January 2019 and observe a PsA and associated precipitating electrons. We develop medium-energy (20-100 keV) electron detector (MED) to measure the electrons responsible for the pulsating-auroral illumination. We present and discuss the results of laboratory experiments we have done so far.