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

[P-CG23]Planetary Magnetosphere, Ionosphere, and Atmosphere

convener:Kanako Seki(Graduate School of Science, University of Tokyo), Takeshi Imamura(Graduate School of Frontier Sciences, The University of Tokyo), Naoki Terada(東北大学大学院理学研究科, 共同), Hiroyuki Maezawa(Department of Physical Science Osaka Prefecture University)
Sun. May 20, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)
Exploration of Moon, Venus, Mars, Mercury, Jupiter, Saturn, and beyond together with rapid developments of numerical simulations provides us new view of planetary environment. This session collects general contributions of new findings about planetary magnetosphere, ionosphere, and atmosphere. New methodology and technology development studies for future explorations are also welcome. In order to put the common knowledge at different planets into perspective, this session aims to facilitate discussions on comparative planetary environments.

[PCG23-P02]On generation, propagation, and dissipation of gravity waves in the Martian upper atmosphere

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The exosphere is a collision-less region located in the uppermost layer of a planetary atmosphere. Because of efficient dissipation due to molecular diffusion (molecular viscosity and thermal conduction), any small-scale perturbations are expected to be quickly dissipated in the exosphere. However, recent MAVEN/NGIMS observations revealed that small-scale, large-amplitude perturbations are persistent even above the exobase at Mars [cf. Terada et al., 2017]. We have investigated statistical properties of these perturbations using MAVEN/NGIMS data and examined possible generation, propagation, and dissipation mechanisms using DSMC simulations of the Martian upper thermosphere-exosphere [Terada et al., 2016]. Based on MAVEN/NGIMS data obtained along satellite's tracks as well as DSMC simulations of gravity waves and acoustic waves propagating from the lower and middle atmosphere, constraints on the wavelength and frequency ranges of perturbations are obtained, which favor gravity wave modes with a very long vertical wavelength. Also investigated are properties of perturbations generated by precipitating pickup ions with DSMC simulations based on MAVEN parameters. Possible generation, propagation, and dissipation mechanisms of the perturbations in the Martian thermosphere-exosphere are discussed based on these results.