
PEM028-P01

Room: Convention Hall

Time: May 24 17:15-18:45

Ion-neutral interaction in the Jovian upper atmosphere

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Jupiter is a planet whose dominant energy source of the magnetosphere is the fast planetary rotation. The energy from quasi-corotating neutral atmosphere is transported to the plasma through ion-neutral collisions, and toward the magnetosphere. On the contrary, the neutral wind dynamics is largely affected by the magnetosphere. In addition, the tilt of the Jovian magnetic dipole axis to the rotation axis shifts the main auroral oval from those aligned with the geographic latitudes, i.e., the interaction between the neutral and plasma would vary along the auroral oval. In order to investigate the effect of the global ion-neutral interaction on the coupling currents which convey angular momentum and energy, we have developed a three-dimensional Jovian thermosphere model to evaluate the effect. The model includes the main physical and chemical processes. As a result, we obtained neutral wind dynamics caused by polar heating and ion drag. The conservation of the current provides the field-aligned current distribution. In the presentation, we would like to discuss the longitudinal distribution of the current relating the oval position and ion-neutral interaction.