ISS-IMAPによる赤道プラズマバブルの観測ー磁気嵐時のバブル発生ー

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Observation of equatorial plasma bubbles using ISS-IMAP - Occurrence of bubbles during geomagnetic storm -

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Equatorial plasma bubbles (EPBs) are large scale structures of depleted plasma density in the ionosphere. Ionospheric irregularities are included in EPBs and cause scintillation on wide-band radio waves. In this study, we examined seasonal-longitudinal dependence of the occurrence of EPBs using airglow images obtained by Ionosphere, Mesosphere, upper Atmosphere, and Plasmasphere mapping on board In- ternational Space Station (ISS-IMAP).

Since the depletion of electron density is associated with EPBs, EPBs are visualized as black lines in 630-nm airglow images. The occurrence rate of EPBs is calculated by the number of EPBs over the observation time. The occurrence rate determined by ISS- IMAP data is high at all longitude (but especially american region) in the equinoctial seasons. This result is consistent with the occurrence rate determined in the previous study, e.g., the observation using plasma density data on DMSP satellite. On the other hand, in summer, these occurrence rates are not consistent; the occurrence rate by ISS-IMAP is high at the American region as equinoctial seasons. We analyze EPB events observed during summer and it is shown that most of these events are subsequently to geomagnetic storm. Since it is reported that penetration electric fields near dusk are eastward and enhances in the stormtime occurred in summer, it is considered that prompt penetrating electric fields enhance the growth rate of EPBs.