EPSC Abstracts
Vol. 9, EPSC2014-773, 2014
European Planetary Science Congress 2014

Topside ionosphere irregularities of equatorial origin

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Abstract

The question about an opportunity to detect the topside plasma bubbles of equatorial origin in their separate plasma component (He^+) is investigated. There are the indications [1, 2, 3] that there is genetic connection between the He^+ density depletions and the equatorial plasma bubbles. For validation of this idea the characteristic times of the main photochemical and electro-dynamical processes, in which the plasma bubbles and their minor ion component (He^+) are involved, have been calculated and compared. He^+ density depletions are usually detected in the topside ionosphere (~1000 km) deeply inside the plasmasphere (L~1.3-3). The model estimations, obtained in SAMIS3 (3D model of equatorial spread F) and kindly presented by J. Huba (USA) [4], are also used for the investigation. It was revealed that the plasma bubbles, reaching the "ceiling" heights, can exist within 10÷13 hours and that there is principal opportunity to observe them in the separate plasma component (He^+).

References

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Acknowledgements

This work was supported by the RFBR grant № 13-05-12111.