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Validation of a new plasmopause model derived from CHAMP field-aligned current signatures

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Recently a new model for the plasmopause location in the equatorial plane was introduced based on magnetic field observations made by the CHAMP satellite in the topside ionosphere (Heilig and Lühr, 2013). Related signals are medium-scale field-aligned currents (MSFAC) (some 10km scale size). An empirical model for the MSFAC boundary was developed as a function of Kp and MLT. The MSFAC model then was compared to in situ plasmopause observations of IMAGE RPI. By considering this systematic displacement resulting from this comparison and by taking into account the diurnal variation and Kp-dependence of the residuals an empirical model of the plasmopause location that is based on MSFAC measurements from CHAMP was constructed. As a first step toward validation of the new plasmopause model we used in-situ (Van Allen Probes/EMFISIS, Cluster/WHISPER) and ground based (EMMA) plasma density observations. Preliminary results show a good agreement in general between the model and observations. Some observed differences stem from the different definitions of the plasmopause. A more detailed validation of the method can take place as soon as SWARM and VAP data become available.

Heilig, B., and H. Lühr (2013) New plasmopause model derived from CHAMP field-aligned current signatures, *Ann. Geophys.*, 31, 529-539, doi:10.5194/angeo-31-529-2013