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Titan's Plasma Environment for T9 and T18 encounters: 3D Hybrid Simulation and Comparison with Observations

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Abstract

We discuss the results of the hybrid simulation of Titan's environment in case of T9 nd T18 encounters. The simulations are based on recent analysis of the Cassini Plasma Spectrometer (CAPS) ion measurements during the T9 and T18 flyby through the induced magnetic tail of Titan [Sittler et al., 2008]. This new result changes our previous model of the interaction of Saturn's rotating magnetosphere with Titan from one that was discussed in the recent publications. The current simulation shows that mass loading by pickup ions H^+, H_2^+, CH_4^+ and N_2^+ is stronger than in the previous simulations. In our hybrid simulations we use Chamberlain profiles for the exosphere's components. We also include a simple ionosphere model. Special attention will be paid to comparing our numerical results with Cassini T-9 and T18 observations. We shall estimate the mass loading rate and the energy input to the upper atmosphere from ambient and pickup ions for the T9 and T18 encounters.

References

Sittler, E.C. et al. (2008) *Spring AGU Meeting*.