



Global hybrid simulations for Titan's plasma interaction

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Titan, the largest moon of Saturn and an important target for the Cassini mission, has a unique plasma interaction with the corotating plasma of the Saturn system. Nitrogen and methane escape from Titan's dense atmosphere as the subsonic and superAlfvénic plasma flow interacts with Titan's iono- and exospheres.

We have developed a global numerical model to study the magnetic erosion processes at Titan. Our quasi-neutral hybrid model has been used to simulate both subsonic and supersonic plasma flows [1]. Our current studies are based on an improved version of the model in which four ion species (H^+ , N^+ , CH_4^+ , N_2^+) are implemented. The poster will try to cover our recent results, including the turning of the iono- and magnetotail due to momentum conservation and the effect of Titan's orbital position to the plasma interaction [2]. Also, measurements from the Cassini plasma and field instruments during first Titan flybys are discussed.

[1] Kallio et al., Geoph. Res. Lett., 31, L15703, doi:10.1029/2004GL020344, 2004.

[2] Sillanpää et al., Hybrid Simulation Study of Ion Escape at Titan for Different Orbital Positions. Adv. Space Res., 2004 (submitted).