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New Ion Impact Simulations for Titan

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Hybrid modelling allows tracking of ion particles in self-consistent electromagnetic fields. At Titan the ion gyromotion plays a significant role in the interaction with the ambient magnetospheric plasma flow of Saturn. We present new hybrid simulation results on the ion deposit fluxes and energies for flow ions as well as Titan's pickup ions.

The water-group ions of the flow are shown to dominate the energy deposition by particles into Titan's ionosphere, while incident protons and pickup ions deposit about a total of a third of the water-group energy in the studied case. Neutral collisions for the incident ions were taken into account via stopping cross sections. We show that Titan's neutral exosphere reduces significantly the flux and energy deposit of especially lighter flow ions into Titan's atmosphere.