



Charged particle tracking at Titan, and further applications

Zsofia Bebesi, Geza Erdos, and Karoly Szego

Wigner Research Centre for Physics, Hungarian Academy of Sciences, Space physics and space technology, Budapest, Hungary (bebesi.zsofia@wigner.mta.hu)

We use the CAPS ion data of Cassini to investigate the dynamics and origin of Titan's atmospheric ions. We developed a 4th order Runge-Kutta method to calculate particle trajectories in a time reversed scenario. The test particle magnetic field environment imitates the curved magnetic environment in the vicinity of Titan. The minimum variance directions along the S/C trajectory have been calculated for all available Titan flybys, and we assumed a homogeneous field that is perpendicular to the minimum variance direction. Using this method the magnetic field lines have been calculated along the flyby orbits so we could select those observational intervals when Cassini and the upper atmosphere of Titan were magnetically connected. We have also taken the Kronian magnetodisc into consideration, and used different upstream magnetic field approximations depending on whether Titan was located inside of the magnetodisc current sheet, or in the lobe regions. We also discuss the code's applicability to comets.