



## **Time-reversed particle dynamics calculation with field line tracing at Titan - an update**

Zsofia Bebesi, Geza Erdos, Karoly Szego, Antal Juhasz, and Katalin Lukacs

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

We use CAPS-IMS Singles data of Cassini measured between 2004 and 2010 to investigate the pickup process and dynamics of ions originating from Titan's atmosphere. A 4th order Runge-Kutta method was applied to calculate the test particle trajectories in a time reversed scenario, in the curved magnetic environment. We evaluated the minimum variance directions along the S/C trajectory for all Cassini flybys during which the CAPS instrument was in operation, and assumed that the field was homogeneous perpendicular to the minimum variance direction. We calculated the magnetic field lines with this method along the flyby orbits and we could determine those observational intervals when Cassini and the upper atmosphere of Titan could be magnetically connected. We used three ion species (1, 2 and 16 amu ions) for time reversed tracking, and also considered the categorization of Rymer et al. (2009) and Nemeth et al. (2011) for further features studies.