Exospheric Heating by Pickup Ions at Titan

W.-L. Tseng(1), W.-H. Ip(1,2) and A. Kopp(3)

(1) Institute of Astronomy, National Central University, Taiwan, China, (2) Institute of Space Science, National Central University, Taiwan, China, (3) Max-Planck-Institut für Sonnensystemforschung, Germany

Titan has a very extensive atmosphere and exosphere which interacts strongly with the co-rotating magnetospheric plasma. Some of the new N^+ and N_2^+ ions created in the vicinity of the exosphere will also reimpact the upper atmosphere causing additional energy input. Previous investigations of the atmospheric collisional interaction of the pickup ions have generally assumed the atmosphere to be spherically symmetric. From the Voyager and Cassini observations, we know that the magnetic field configuration and plasma flow field should be highly asymmetric. To study the possible spatial variation in the pickup ion influx, we have employed the plasma data from the three dimensional MHD simulation from Kopp and Ip to compute the trajectories of the pickup ions. Such simulation will be valuable in comparing the energy influx to the equatorial and polar regions of Titan's atmosphere.