Geophysical Research Abstracts,
Vol. 11, EGU2009-6265, 2009
EGU General Assembly 2009


# Titan
# ś Hydrodynamically Escaping Atmosphere and the Structure of the Exobase Region

D. F. Strobel
Johns Hopkins University, EGS/Olin Hall 121, Baltimore, MD 21218, United States (STROBEL@JHU.EDU, 001-410-51)

In a previous paper (Strobel, Icarus, 193, 588-594, 2008), I have argued that the upper atmosphere of Titan is undergoing hydrodynamic escape as a high density, slow outward expansion, driven principally by solar UV heating by CH4 absorption. The hydrodynamic mass loss, currently at a rate 4̃-5) x 1028 amu/s, is essentially CH4 and H2 escape (Cui et al. J. Geophys. Res. in press, 2008; Yelle et al. J. Geophys. Res., in press, 2008) and limited by available solar UV power. The slow hydrodynamic expansion solutions below the exobase must be matched to an escape model in the exosphere, and there is still considerably controversy on the acceleration mechanism to achieve escape speeds. From Cassini INMS data, the structure of the ëxobase regionön Titan will be explored and demonstrated to not be a thin transition level to an instanteously collisionless exosphere, as is normally assumed, but rather an extended region of Ĩ000 km, which is quasi-collisional. Processes that may considerably increase the current mass loss rate will be discussed.