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Low energy ion loss at Mars

S. Curry (1), M. Liemohn (1), X. Fang (2), and Y. Ma (3)

(1) University of Michigan, Atmospheric, Oceanic, and Space Sciences, Ann Arbor, MI, United States (smcurry@umich.edu), (2) University of Colorado, Laboratory for Atmospheric and Space Physics, Boulder, CO, United States , (3) University of California, Institute of Geophysics and Planetary Physics, Los Angeles, CA, United States

Current data observations and modeling efforts have indicated that the low-energy pick-up ions on Mars significantly contribute to the overall escape rate. Due to the lack of a dipole magnetic field, the solar wind directly interacts with the dayside upper atmosphere causing particles to be stripped away. In this study, we use a 3-D Monte Carlo test particle simulation with virtual detectors to observe low energy ions (< 50 eV) in the Mars space environment. We will present velocity space distributions that can capture the asymmetric and non-gyrotropic features of particle motion. The effect of different solar conditions will also be discussed with respect to ion fluxes at various spatial locations as well as overall loss in order to robustly describe the physical processes controlling the distribution of planetary ions and atmospheric escape.