

Abstract Submitted  
for the HAW05 Meeting of  
The American Physical Society

**Influence of Interstellar Neutrals as an Atmosphere on Charged Particle Flux in the Heliosphere** M.A.K. LODHI, Dept. Physics, Texas Tech University, THOMAS WILSON, NASA, Johnson Space Center - KR, ABEL DIAZ, Dept. Physics, Texas Tech University — It has been shown that the charged particle flux in the Earth's trapped radiation belts is a bi-variant function of energy and atmospheric density [1,2], where the density is modulated by variation in activity of the Sun during its solar cycle. This result was derived from a regression algorithm technique used in nuclear physics for studying momentum-dependent potentials. A dynamic background of atmospheric neutrals, then, has a definite effect upon charged-particle flux and fluence and contributes to energy losses primarily due to multiple neutral and Coulomb scattering. Cosmic-ray flux is not merely a function of energy, but rather is a two-dimensional surface depending upon density of atmospheric neutrals as well. We extend this result to the Sun's heliosphere where the source of atmospheric neutrals is the Local Interstellar Medium (LISM) of the Galaxy. The Sun's activity once again modulates density in the heliosphere via the solar wind's heliopause, while inhomogeneities in the LISM affect the neutral density as the heliosphere moves through it. As to be expected, the low-energy cosmic-ray flux is bi-variant in energy and density of neutrals. Anomalous cosmic rays naturally participate in this picture. [1] Lodhi, M.A.K., et al., *Rad. Meas.* 39, 391 (2005). [2] Diaz, A., et al., *Lunar and Planetary Sci.* 36, 1197 (2005).

M.A.K. Lodhi  
Dept. Physics, Texas Tech University

Date submitted: 27 May 2005

Electronic form version 1.4