

**LUNAR SURFACE ORIGINS EXPLORATION (LUNASOX): VIRTUAL OBSERVATORY FACILITY FOR SOLAR WIND PLASMA INTERACTIONS WITH THE MOON.** John F. Cooper<sup>1</sup>, Joseph H. King<sup>2</sup>, Natalia E. Papitashvili<sup>2</sup>, Howard K. Hills<sup>3</sup>, and Alexander S. Lipatov<sup>4</sup>, <sup>1</sup>Heliospheric Physics Laboratory, Code 672, NASA Goddard Space Flight Center, Greenbelt, MD 20771, John.F.Cooper@nasa.gov, <sup>2</sup>ADNET Systems Inc., Heliospheric Physics Laboratory, Code 672, NASA Goddard Space Flight Center, Greenbelt, MD 20771, Joseph.H.King@nasa.gov, Natalia.E.Papitashvili@nasa.gov, <sup>3</sup>ADNET Systems Inc., NSSDC, Code 690.1, Goddard Space Flight Center, Greenbelt, MD 20771, Howard.K.Hills@nasa.gov, <sup>4</sup>University of Maryland Baltimore County, 5523 Research Park Dr., Baltimore, MD 21228-4680, alipatov@umbc.edu.

**Abstract:** A new virtual observatory facility is being implemented in support of advanced modeling for solar wind plasma interactions with the lunar surface and atmospheric environments. The NASA Heliophysics virtual observatory approach of open on-line metadata registration, discovery, access, and supporting value-added tools is being applied to selected data products from lunar surface, lunar orbital, and earth-orbiting solar wind monitors. The LunaSOX facility at luna-sox.gsfc.nasa.gov will be operated by a science focus group for NASA's Virtual Heliospheric Observatory. Initial primary focus is on the Apollo ALSEP 12 and 15 solar wind monitor data products already accessible on-line in through the Coordinated Data Analysis Web (CDAWeb) service of the NASA Space Physics Data Facility (SPDF). These data have been recast in forms appropriate for support of plasma interaction modeling and the new value-added data products will be posted through the virtual observatory. Data browser services reapplied to the ALSEP data from the OMNIWeb service for solar wind monitor data are available for plots, listings, occurrence frequency distributions and statistics, and scatter plots, and linear regression fits. Supporting lunar and Earth orbit data of the Apollo era in the NASA archives will be similarly treated and posted on-line. Selected data analysis (e.g., OMNIWeb), orbital ephemeris (SSCWeb), and associated visualization tools of SPDF are being utilized in support of the virtual observatory and plasma interaction modeling efforts. Hourly resolution impact parameters are being provided for heliocentric longitudinal offsets of positions for solar wind monitors and objects (e.g., IMP-8, Wind, ACE, Geotail, Earth) with respect to the Moon.