Solar Minimum Condition and Galactic Particle Flux Assessment with Voyager, Ulysses and ACE/CRIS Data

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Model calculated particle flux as a function of time during the current solar cycle minimum condition (#23 and #24) with the data from Voyager (40AU), Ulysses (5AU) and ACE/CRIS data (1AU) are being analyzed and assessed for radiation environment. We compare the measured particle flux with the NASA model calculations making use of HZETRN (High Z and Energy Transport) code along with the newly adopted expansions of nuclear fragmentation cross sections that are described by the quantum multiple scattering (QMSFRG) model. The time dependant variation of the GCR environment is derived making use of the solar modulation potential, phi. Galactic Cosmic Ray (GCR) environment during the current and historically known lower solar minimum condition indicate some of the very high anticipated measurements of particle spectral data. Data from the Ulysses spacecraft in the polar orbit about the sun during the years 2006 and 2009 provided proton and alpha particle flux data and showed such anticipated high particle flux. Also, ACE/CRIS spacecraft data during the years 2006 and 2009 showed some of the high particle flux measurements of several heavy ions such as oxygen and iron. We present proton flux from Voyager and compare with Ulysses and ACE/CRIS measured data along with model calculations.