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NASA galactic cosmic radiation environment model: Badhwar - O'Neill (2014)

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The Badhwar-O'Neill (BON) Galactic Cosmic Ray (GCR) flux model has been used by NASA to certify microelectronic systems and in the analysis of radiation health risks for human space flight missions. Of special interest to NASA is the kinetic energy region below 4.0 GeV/n due to the fact that exposure from GCR behind shielding (e.g., inside a space vehicle) is heavily influenced by the GCR particles from this energy domain. The BON model numerically solves the Fokker-Planck differential equation to account for particle transport in the heliosphere due to diffusion, convection, and adiabatic deceleration under the assumption of a spherically symmetric heliosphere. The model utilizes a comprehensive database of GCR measurements from various particle detectors to determine boundary conditions. By using an updated GCR database and improved model fit parameters, the new BON model (BON14) is significantly improved over the previous BON models for describing the GCR radiation environment of interest to human space flight.

Author: Dr RIOS, Ryan (NASA Johnson Space Center)

Co-authors: O'NEILL, Pat (NASA Johnson Space Center); GOLGE, Serkan (University of Houston/JSC NASA); SLABA, Tony (NASA Langley Research Center)

Presenter: Dr RIOS, Ryan (NASA Johnson Space Center)

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