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Evaluation of galactic cosmic rays (GCR) models using AMS2 and PAMELA measurements

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Traditionally, Galactic Cosmic Rays (GCR) models are used as a boundary condition input to the deterministic or stochastic (e.g. Monte Carlo) based radiation transport codes with the goal of extracting dosimetric quantities of interest such as dose, dose equivalent, effective dose, etc. at a desired target point within the spacecraft. To compute the dosimetric quantities of interest, the geometry and mass property of the spacecraft which represent the structure and detector are defined through a ray-tracing process. The transported fluxes are then used to interpolate on the ray-traces at different depths of materials to complete the computation.
In this talk, three widely used free space GCR models are evaluated against measurements by the Alpha Magnetic Spectrometer 2 (AMS2) and the Payload for Antimatter Matter Exploration and Lightnuclei Astrophysics (PAMELA) detectors. The AMS2 is mounted on the main truss of the International Space Station (ISS), while PAMELA is mounted on the exterior of the Russian Resurs DK1 satellite. For the three GCR models particular emphasis is put on energy region where GCR peaks (i.e. Ek < 3 GeV) to evaluate the discrepancies between the models and the AMS2/PAMELA measurements.

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