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Benchmarking Radiation Transport Codes for Space Missions RAM TRIPATHI, NASA Langley Research Center, Hampton, VA, JOHN WIL-SON, NASA Langley Research Center, LARRY TOWNSEND, University of Tennessee, TONY GABRIEL, SID, Knoxville, TN, LARRY PINSKY, University of Houston, TONY SLABA, Old Dominion University — For long duration and/or deep space human missions, protection from severe space radiation exposure is a challenging design constraint and may be a potential limiting factor. The space radiation environment consists of galactic cosmic rays (GCR), solar particle events (SPE), trapped radiation, and includes ions of all the known elements over a very broad energy range. These ions penetrate spacecraft materials producing nuclear fragments and secondary particles that damage biological tissues, microelectronic devices, and materials. Accurate risk assessments critically depend on the accuracy of the input information about the interaction of ions with materials, electronics and tissues and the radiation transport codes. Due to complexity of the problem and paucity of huge amount of experimental data, it is prudent to benchmark leading radiation transport codes to build increasing confidence in exposure estimates. The deterministic code HZETRN2006, and the Monte Carlo Codes HETC-HEDS and FLUKA, are used for benchmarking efforts. The SPE Webber spectrum and 1977 GCR radiation environments has been taken to make radiation dose exposure studies on aluminum shield followed by water target.

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