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Cross Section Sensitivity and Propagated Errors in Hze Exposures (Paperback)

By John H Heinbockel

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.It has long been recognized that galactic cosmic rays are of such high energy that they tend to pass through available shielding materials resulting in exposure of astronauts and equipment within space vehicles and habitats. Any protection provided by shielding materials result not so much from stopping such particles but by changing their physical character in interaction with shielding material nuclei forming, hopefully, less dangerous species. Clearly, the fidelity of the nuclear cross-sections is essential to correct specification of shield design and sensitivity to cross-section error is important in guiding experimental validation of cross-section models and database. We examine the Boltzmann transport equation which is used to calculate dose equivalent during solar minimum, with units (cSv/yr), associated with various depths of shielding materials. The dose equivalent is a weighted sum of contributions from neutrons, protons, light ions, medium ions and heavy ions. We investigate the sensitivity of dose equivalent calculations due to errors in nuclear fragmentation cross-sections. We do this error analysis for all possible projectile-fragment combinations (14,365 such combinations) to estimate the sensitivity of the shielding calculations...



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