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Nuclear data needs for protection from space radiation

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With plans for Moon and Mars exploration, the protection of astronauts from the harmful effects of space radiation is a high priority for NASA. Space radiation transport codes use nuclear fragment production cross sections that describe how incident radiation from Galactic cosmic rays and other sources interacts with target materials such as spacecraft or human tissue. Double-differential cross section data are needed for production of protons, neutrons, light ions (hydrogen and helium isotopes) and pions from nucleus-nucleus collisions with projectile energies from 50 MeV/n up to 50 GeV/n using a variety of projectiles from hydrogen through to nickel. The availability of nuclear cross section data needed for space radiation protection will be reviewed, and gaps in the data will be discussed.

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