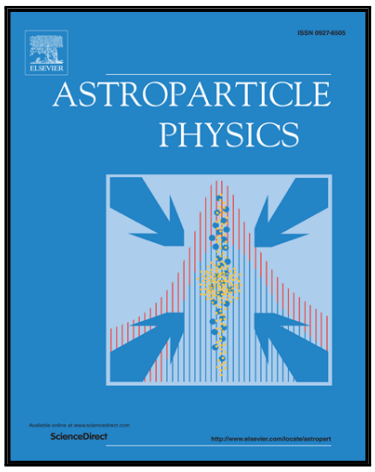

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Cosmogenic production of tritium in dark matter detectors

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Abstract

The direct detection of dark matter particles requires ultra-low background conditions at energies below a few tens of keV. Radioactive isotopes are produced via cosmogenic activation in detectors and other materials and those isotopes constitute a background source which has to be under control. In particular, tritium is specially relevant due to its decay properties (very low endpoint energy and long half-life) when induced in the detector medium, and because it can be generated in any material as a spallation product. Quantification of cosmogenic production of tritium is not straightforward, neither experimentally nor by calculations. In this work, a method for the calculation of production rates at sea level has been developed and applied to some of the materials typically used as targets in dark matter detectors (germanium, sodium iodide, argon and neon); it is based on a selected de-

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