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Study of Cosmic-Ray Transport with the GALPROP Code

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The isotopes ^2H and ^3He in the cosmic radiation are mainly secondary products from interactions of primary cosmic rays in the interstellar medium. Secondary-to-primary ratios give important information on processes that occurred during the propagation of cosmic rays, independent of the unknown source spectrum. Boron-to-Carbon ratio data have been primarily used to study cosmic-ray transport. As statistics have increased and mass resolution have improved, recent measurements on cosmic-ray hydrogen and helium isotopes provide another probe for their propagation in the Galaxy. In this paper, we use the GALPROP numerical code for calculating the propagation of relativistic charged particles. The standard GALPROP code had to be modified to be suitable for hydrogen and helium isotopes in the energy region 0.2 to 1.5 GeV/n. The proton fusion process for production of ^2H had to be added, and production cross sections for light isotopes had to be updated at these energies. We will present the modifications made on GALPROP for its application to proton and helium isotopes.

Collaboration

– not specified –

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