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New constraints in modelling galactic deuterons in the heliosphere

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The interest in the origin and modulation of cosmic ray deuterons is expected to increase significantly now that observations from AMS-02 and PAMELA detectors have become available. Observations made by AMS-02 reveal the spectral shape and features of galactic deuteron over the rigidity range 1.92 GV –19.5 GV, whereas that from PAMELA are at a lower rigidity, from 0.75 GV –2.5 GV. These observations provide interesting surprises with subsequent challenges to the established paradigm of the secondary origin of galactic deuterons. In this study a comprehensive 3D numerical model and a set of diffusion and drift coefficients, previously applied to a number of cosmic ray nuclei, together with a newly estimated local interstellar spectrum for deuterons, are used to simulate the modulation of deuteron from 2006 to 2022. The modelling results will be compared to observations made by PAMELA and AMS-02 detectors.

Collaboration(s)

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