

New 3D models of interstellar gas and their impact on high-energy interstellar emission

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The interstellar gas plays a key role in the astrophysics of cosmic-rays (CRs). The gas serves as a target for the CR particles causing energy losses and generation of secondary CR particles and the high-energy interstellar emission. Observations of the spectra and abundances of these secondary particles are used to decipher the propagation history of CRs and to decode possible signatures of new physics. Until now, most calculations of CR propagation have used 2D cylindrically symmetric models for the distribution of the interstellar gas. This is partly due to the inevitable difficulties in determination of the 3D gas distributions. We present a method for determination of the 3D distribution of interstellar gas and our preliminary results. We discuss the effect these new 3D models may have on the analysis and interpretation of CR propagation and high-energy interstellar emissions.

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