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Galactic Diffuse Gamma-Ray Emission From 3D Cosmic-Ray Transport Models

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The PICARD code for the numerical solution of the Galactic cosmic-ray propagation problem allows for high-resolution 3D models that can acknowledge localised structures within our Galaxy. Using PICARD, we address the impact of different transport physics processes on the flux and distribution of diffuse Galactic gamma rays: we investigate models with a cosmic-ray source distribution aligned with different arrangements of the Galactic spiral arms, under consideration of a recently updated interstellar radiation field model, and those assuming anisotropic cosmic-ray diffusion governed by an improved Galactic magnetic field model. The choice of changing the different transport parameters is most readily visible in the inverse-Compton channel, which shows features not present in commonly-used axisymmetric transport models.

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