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Diffuse Emission from the Milky Way with Picard

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We will give an overview of recent developments in numerical modelling of cosmic-ray transport and ensuing gamma-ray emission within our Galaxy using the Picard code. Picard is a cosmic-ray propagation code allowing for efficient solution of spatially three-dimensional models. We will discuss challenges at arriving at the necessary three-dimensional models of our Galaxy that determine the transport of cosmic rays. In particular, we will focus on the distribution of cosmic-ray sources and of Galactic gas in our Galaxy and their impact on cosmic-ray transport and gamma-ray emission. Especially the latter impacts cosmic-ray transport via multiple transport processes and, additionally, acts as the target for the cosmic-rays to produce gamma-rays. We will show results of corresponding models and related gamma-ray emission especially in the TeV regime.

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