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Contribution of Monogem to the Galactic Cosmic Ray Spectrum

The study of nearby cosmic ray (CR) sources is crucial for understanding the anomalous features observed in energy spectra of CR nuclei, as well as the reversal of both the amplitude and phase of CR anisotropy around 100 TeV. Among the candidate sources, Geminga and Monogem are frequently considered the primary contributors to the observed CR spectrum. However, the precise contribution of Monogem remains an open question. In this work, we perform a detailed reanalysis of the contributions from these two nearby sources using a three-dimensional spatial-dependent propagation model that explicitly accounts for the halo structure of CR sources. Our results indicate that, within this framework, CRs originating from Monogem are largely prevented from reaching Earth due to obstruction by the Geminga pulsar halo. Consequently, Geminga emerges as the dominant contributor to the local CR spectrum.

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