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Modelling the gamma-ray diffuse emission of the Galaxy up to PeV

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The Tibet ASgamma and LHAASO collaborations recently reported the observation of a gamma-ray diffuse emission from the Galactic plane with energy up to the PeV.
We show that under physically motivated conditions these results, together with those of Fermi-LAT and ARGO-YBJ at lower energies, can consistently be interpreted in terms of an emission originated by the Galactic cosmic-ray (CR) population, the so called "CR sea".
Our analysis favour CR transport models characterised by spatial-dependent diffusion although some degeneracy remains between the choice of the transport scenario and that of the CR spectral shape above 10 TeV. We discuss the possible relevance of forthcoming measurements, especially those performed by experiments located in the South hemisphere, in resolving that ambiguity. We will then present examples of high resolution maps and spectra of the simulated gamma-ray diffuse emission of the Galaxy from few GeV up to the PeV which we release and can be used by experimental collaborations as templates.

(based on https://arxiv.org/abs/2203.15759)

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