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Gamma Rays and Neutrinos from the Galactic Plane at the PeV frontier

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Last year the Tibet ASgamma experiment reported the observation of a diffuse gamma-ray emission from the Galactic plane with energy up to the PeV. This finding seems to be confirmed by LHAASO preliminary results. Both measurements provide the first evidence of a diffuse gamma-ray emission throughout the Galaxy up to such high energies.

These results have relevant implications for neutrino astronomy since they strengthen the expectation that a neutrino diffuse emission from the Galactic plane could soon be discovered by IceCube and KM3NeT.

To explore this possibility we use physically motivated numerical models which reproduce the observed gamma-ray diffuse emission angular distribution and spectral energy distribution from few GeV up to the PeV under the hypothesis that is mostly originated by the cosmic ray population of the Galaxy.

We will discuss the possible detectability of the associated neutrino emission and the valuable implications it may have for understanding the origin and propagation of cosmic rays.

Partially based on: <https://arxiv.org/abs/2203.15759>

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