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# Cosmic ray hardening in the inner Galaxy and its gamma-ray and neutrino imprints

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The Galaxy is a guaranteed source of neutrinos produced by the interaction of cosmic rays (CRs) with the interstellar gas. According to conventional CR propagation models, however, this emission may be too weak to be detected even by Km<sup>3</sup>-scale neutrino telescopes. This expectation has to be revisited in the light of recent Fermi-LAT findings showing that the CR spectrum in the inner Galactic plane is significantly harder than that inferred from local CR measurements. Here we present some relevant predictions of a phenomenological model –assuming spatially-dependent CR diffusion –which was recently developed to reproduce that large-scale trend. In particular, we show that our model correctly predicts the TeV  $\gamma$ -ray diffuse emission measured by Milagro and H.E.S.S. in the inner Galaxy and Galactic Center (GC) region respectively. The implications of our findings for the possible presence of a PeVatron in the GC will be also discussed. In another talk of this conference A. Marinelli may present our results of the computation of the corresponding neutrino emission and compare them with available experimental results by ANTARES and IceCube.

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