

Towards a refined understanding of the Galactic Center excess

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There is a striking evidence for a roughly spherical-symmetric diffuse gamma-ray signal peaked in the Galactic Center (GC) region, extended up to several degrees off the GC.

Here we critically review the main points regarding the derivation of this signal, characterized by means of the template-fitting method. In particular we focus our attention on the usual Inverse Compton (IC) component adopted for the background emission, finding that it does not provide a realistic description of the complex GC environment. Driven by the evidence of a large gas density in the inner kpc of the Galaxy correlated with an impressive Supernova rate (2 order of magnitude larger than the Galactic average), and therefore with ongoing CR acceleration, we are able to show that no clear evidence of the aforementioned excess comes out when a possibly more realistic diffuse CR source term is taken into account.

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