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Phenomenological models comparison to untangle the origin of the gamma-ray emission from the Galactic Centre region

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The Galactic Centre (GC) represents an intriguing playground for the astroparticle community where studying physical processes and testing theories and models. The complexity of such a region is evident at each wavelength of the electromagnetic spectrum: even at the shortest one the GC region assumes a key-role for understanding the nature and origin of the emission observed in γ -rays. The lack of a definitive explanation of such emission makes of the GC a privileged laboratory. SgrA—the SMBH located in the centre of the Milky Way—may be the favorite candidate to be the PeV-accelerator of cosmic-rays (CRs) in Our Galaxy. Or the evidence that the CR spectrum gets harder approaching the centre. Or the existence of still unobserved population of PWNe and SNRs. Or the decay/annihilation of Dark Matter are among the most plausible scenarios invoked to explain the measured gamma-ray emission. But the impact of systematics afflicting the data makes arduous to reach robust conclusions.

In view of the next generation experiments and observatories, a detailed analysis of several phenomenological models for the dubbed CR-Sea—computed with DRAGON and GAMMASKY codes—is scrutinised in comparison with the observed spectra from the inner Galaxy. This study assumes a fundamental role in the analysis-chain of such data since represents the only method providing the background model for studying extended sources, as the Galactic Centre region, and characterizing its emission.*

Submitted on behalf of a Collaboration?

No

Author: VENTURA, Sofia (University of Siena & INFN Pisa)

Presenter: VENTURA, Sofia (University of Siena & INFN Pisa)

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