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Potential dark matter signals at neutrino telescopes

Recent analyses of the diffuse TeV-PeV neutrino flux highlight a tension between different IceCube data samples that suggests a two-component scenario rather than a single steep power-law. Such a tension is further strengthened once the latest ANTARES data are also taken into account. Remarkably, both experiments show an excess in the same energy range (40-200 TeV), whose origin could intriguingly be related to dark matter. In this talk, I describe in a multi-messenger context the allowed features of a potential dark matter signal at neutrino telescopes according to the latest 7.5 years IceCube HESE events making the comparison with previous exclusion limits coming from Fermi-LAT data. Moreover, I discuss whether the Dark Matter hypothesis could be further scrutinized by using forthcoming high-energy gamma-rays experiments.

Mini-abstract

A second leptophilic decaying dark matter component is preferred at 68% C.L. by HESE neutrinos.

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