

Indirect Dark Matter searches and fundamental physics studies with MAGIC

Summary

Since the beginning of operations, the MAGIC telescopes have been carrying out deep observations of several promising dark matter targets, such as galaxy clusters, the Galactic Center, and dwarf satellite galaxies, with the aim of detecting such signals or alternatively constraining dark-matter annihilation processes up to the TeV mass scale.

In this contribution we present the latest indirect dark matter search results achieved, for which MAGIC reached the strongest constraints on dark matter annihilation searches above few hundreds GeV.

The universality of dark matter properties allows the combination of data from different experiments and/or observational targets into a global and sensitive-optimized search. We have implemented this analysis framework and applied it to the MAGIC and Fermi-LAT observations of dwarf satellite galaxies, obtaining the most constraining bounds to dark matter properties for masses between 10 GeV and 100 TeV from dwarf galaxies observations.

Finally, we will review MAGIC searches for violations of Lorentz Invariance exploiting possible non-trivial dispersion relations of photons travelling cosmological distances.

Primary author: GAUG, Markus (Universitat Autònoma de Barcelona)

Presenter: GAUG, Markus (Universitat Autònoma de Barcelona)

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