

Indirect Dark Matter Searches with the MAGIC Telescopes

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MAGIC is a ground-based system of two, 17 m diameter Imaging Atmospheric Cherenkov Telescopes (IACT) located in the Canary island of La Palma. MAGIC-I has been operational since 2004 and it already achieved the lowest energy threshold among the current generation of IACTs. In 2009 it was joined by MAGIC-II, and together, in the stereoscopic mode, they allow for the observations of significantly improved sensitivity, lower energy threshold and better energy and angular resolution.

The search for Dark Matter (DM) with MAGIC consists of looking for the signatures of very-high energy (VHE) gamma-rays that originate from the annihilation of hypothetical DM particles. The gamma-ray spectrum resulting from that process should bear distinctive features (like spectral line or cut-off), correlated to the DM particle mass, which, according to some models, in the case of WIMPs should be in the VHE range and, therefore, detectable by IACTs. However, identification of these features, though they are universal, is a challenge, since the potential DM signal usually remains invisible under the dominant gamma-radiation from conventional astrophysical objects. For this reason, we direct our search with MAGIC to the objects with large amounts of DM, like Galactic Center, the dwarf spheroidal galaxies and galaxy clusters.

Here we report on the indirect DM searches performed with MAGIC so far, and also present the prospects for the future stereoscopic observations. We discuss how these results can be used to set constraints on DM parameter's space of certain supersymmetric models.

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