

Constraints on Dark Matter annihilations signals with the H.E.S.S. Inner Galaxy Survey

Dark Matter (DM) can explain many astrophysical and cosmological measurements. However, its underlying nature remains a mystery. Weakly interacting massive particles (WIMPs) are among the most promising candidates to explain DM. The former have mass and coupling strength at the electroweak scale. If WIMPs are thermally-produced in the early universe, a relic density should still be present and consistent with that needed to explain the non-visible matter. Self-annihilating WIMPs would produce Standard Model particles and gamma-rays in the final state, which have been searched for a long time to probe DM. The inner halo of the Milky Way is predicted as the brightest source of DM annihilation. Several degrees of this region have been surveyed by the H.E.S.S. Collaboration for the Inner Galaxy Survey (IGS), with the aim of achieving the best sensitivity to faint and diffuse emissions. To search for DM signal, we performed an analysis of about 550 hours of observations in the IGS dataset collected between 2014 and 2020 with the full five-telescope array. Since no significant excess was found, we derived new limits on the velocity-weighted annihilation cross-section of WIMPs. Different annihilation channels can be inspected to probe thermal DM in the TeV mass range.

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