

Dark Matter constraints from Fermi-LAT inner Galaxy measurements

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We derive stringent constraints on parameters of generic dark matter candidates in the likely case that the collapse of baryons to the Galactic Center is accompanied by the contraction of the dark matter. By comparing theoretical predictions with the gamma-ray emission observed by the Fermi-LAT from the region around the Galactic Center, we find that for all the annihilation channels studied, the upper limits on the annihilation cross section imply that the thermal cross section is excluded for a large range of dark matter mass. Our analysis is conservative since it simply requires that the expected dark matter signal does not exceed the observed gamma-ray emission by the Fermi-LAT in optimized regions around the Galactic Center. The upper limits on the annihilation cross section of dark matter particles obtained are two orders of magnitude stronger than without contraction. In the latter case our results are compatible with the upper limits previously reported by the Fermi-LAT collaboration, where the thermal cross section is not excluded after analyzing the Galactic halo with the same conservative approach without modeling of the astrophysical background.

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