PROCEEDINGS OF SCIENCE

Spotting imprints of dark matter in the extragalactic Fermi sky with photon counts statistics

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The dissection of the extragalactic gamma-ray background (EGB) into point sources and diffuse components is a valuable tool to search for new physics such as dark matter. In the recent past, it has been shown that statistical analysis methods can excel the sensitivity of classic source detection algorithms with regard to population studies. In this contribution, we analyze the eight-year Fermi-LAT data between 1 and 10 GeV by considering 1-point photon counts statistics. We aim at resolving the population of extragalactic point sources and decomposing the diffuse component into Galactic foreground emission and isotropic diffuse background emission. For the first time, the analysis is employed to incorporate a potential contribution from annihilating dark matter (DM), investigating the sensitivity reach of 1-point photon counts statistics for the DM thermally-averaged self-annihilation cross section $\langle\sigma v\rangle$. We find that the sensitivity of 1-point statistics is highly competitive with upper limits recently obtained by other indirect detection methods.

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