Contribution ID : **162** Type : **Poster**

Sensitivity of the Cherenkov Telescope Array to dark subhalos

Monday, 30 August 2021 19:15 (15)

In this work, we study the potential of the Cherenkov Telescope Array (CTA) for the detection of Galactic dark matter (DM) subhalos. We focus on low-mass subhalos that do not host any baryonic content and therefore lack any multiwavelength counterpart. If the DM is made of weakly interacting massive particles (WIMPs), these dark subhalos may thus appear in the gamma-ray sky as unidentified sources. A detailed characterization of the instrumental response of CTA to dark subhalos is performed, for which we use the ctools analysis software and simulate CTA observations under different array configurations and pointing strategies, such as the scheduled extragalactic survey. This, together with information on the subhalo population as inferred from N-body cosmological simulations, allows us to predict the CTA detectability of dark subhalos, i.e., the expected number of subhalos in each of the considered observational scenarios. In the absence of detection, for each observation strategy we set competitive limits to the annihilation cross section as a function of the DM particle mass. Interestingly, we find the best constraints to be reached with no dedicated observations, by just accumulating exposure time from all scheduled CTA programs and pointings over the first 10 years of operation. This way CTA will offer the most constraining limits from subhalo searches in the intermediate range between 1 – 3 TeV, complementing previous results with Fermi-LAT and HAWC at lower and higher energies, respectively. This work is based on [2101.10003] and has been developed within the CTA Consortium.

Reference to paper (DOI or arXiv)

https://arxiv.org/abs/2101.10003

Your gender (free text)

Primary author(s) : CORONADO-BLÁZQUEZ, Javier (IFT UAM CSIC)

Presenter(s) : CORONADO-BLÁZQUEZ, Javier (IFT UAM CSIC)

Session Classification : Poster session 1

Track Classification : Dark Matter and its detection