

Refined Dark Matter Spectra for Cherenkov Telescopes

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Cherenkov telescopes such as HESS, VERITAS, and CTA, represent one of the most promising avenues to detect popular dark matter candidates like the wino, higgsino, and minimal dark matter. Yet theoretical predictions for the annihilation rate and spectrum of photons produced in such models is a notoriously difficult multi-scale problem, sensitive to the dark matter mass, electroweak scale, and also the energy resolution of the detector. In this talk I will explain how to overcome these challenges using an effective field theory description. This approach allows for an explicit factorization and consistent treatment of the different scales. Taking the example of wino dark matter, this approach results in a photon spectrum which can deviate noticeably from an exact line, and I will present an estimate of how these variations impact the HESS galactic center dark matter line search.

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