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Dark Matter Detection Prospects for the Cherenkov Telescope Array

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The Cherenkov Telescope Array (CTA) is an international project for a next-generation ground-based gamma-ray observatory. CTA, conceived as an array of few tens of imaging atmospheric Cherenkov telescopes, is aiming to improve on the sensitivity of current-generation experiments by an order of magnitude, with an energy coverage from more than thirty GeV to 100 TeV. CTA can provide clues about major open questions in fundamental physics, such as the elusive nature of the dark matter component of the Universe. Here we study the CTA prospects for detection of dark matter, evaluating several possible array layouts whose expected performance is assessed from Monte Carlo simulations. We consider different observation strategies and classes of targets: dwarf spheroidal galaxies of the Milky Way, the Galactic Center, and clusters of galaxies.

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