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Sensitivity of CTA to dark matter annihilations in the galactic centre

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We present prospects for detection of WIMP dark matter at the Cherenkov Telescope Array (CTA). We derive a realistic assessment of the sensitivity of CTA to photon fluxes from dark matter annihilation by means of a binned likelihood analysis for the Einasto and Navarro-Frenk-White halo profiles. We use the most up to date instrument response functions and background simulation model provided by the CTA Collaboration. We find that, with 500 hours of observation, under the Einasto profile CTA is bound to exclude at the 95% C.L. realistic and well motivated dark matter candidates, like the 1 TeV higgsino region of the MSSM. CTA will be able to probe the vast majority of cases corresponding to a spin-independent scattering cross section below the reach of 1-tonne underground detector searches for dark matter, in fact even well below the irreducible neutrino background for direct detection and will provide a highly sensitive way of searching for dark matter that will be partially overlapping and partially complementary with 1-tonne detector and collider searches. It will thus be instrumental to, for example, effectively explore the nearly full parameter space of the MSSM.

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