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Dependence of accessible dark matter annihilation cross sections on the density profiles of dSphs

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Dwarf spheroidal galaxies (dSphs) are good target to search for dark matter annihilation signals with gamma-ray observations. For WIMPs lighter than $m_{\rm DM} \sim calO(10)$ GeV, the strongest constraints are obtained by Fermi's observation of dSphs. In the near future, our accessibility to WIMPs heavier than $m_{\rm DM} \sim calO(1)$ TeV should be significantly enhanced with Cherenkov Telescope Array (CTA). The importance of the dark matter spatial distribution in dSphs increases because the angular resolution of CTA facilities are much finer than the typical size of dSphs. We evaluate how our accessibility to WIMP depends on the models of dark matter distribution in dSphs and discuss the implications.

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