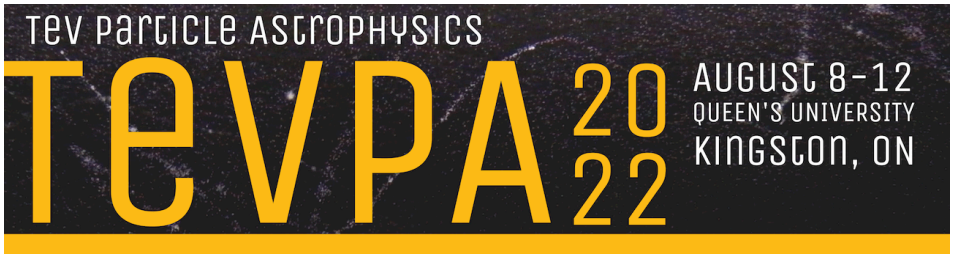


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# Impact of the particle physics model on dark matter indirect detection limits

*Wednesday 10 August 2022 14:40 (20 minutes)*

Cosmological and astrophysical probes suggest that dark matter (DM) would make up for 85\% of the total matter content of the Universe. However, the determination of its nature remains one of the greatest challenges of fundamental physics. Assuming the ΛCDM model, Weakly Interacting Massive Particles (WIMPs) would annihilate into Standard Model particles, such as $\gamma$ rays, which could be detected by ground-based telescopes. Dwarf spheroidal galaxies represent promising targets for such indirect searches as they are assumed to be highly dark matter dominated with the absence of astrophysical sources nearby. So far, previous studies have presented upper limits on the annihilation cross section $\langle\sigma v\rangle$ assuming single exclusive annihilation channels. In this work, we consider more realistic particle physics models and take into account their complete annihilation pattern in order to study their impact on the derivation of the upper limits on the dark matter annihilation cross section. We use mock data for the Cherenkov Telescope Array (CTA) simulating the observations of two promising dwarf spheroidal galaxies, Sculptor and Draco. We show the impact of considering the full decay pattern within two phenomenologically viable particle physics models.

## Collaboration name

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