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Tidal Disruption Events as Dark Matter Probe

Tidal Disruption Event (TDE) is an astrophysical event where stars are tidally disrupted as they pass near a black hole. This event results in a flux of high-energy neutrinos. IceCube data suggests the presence of these neutrinos in TDEs. The emitting region of neutrinos and photons is likely to be located near the central black hole, where the dark matter density may be significantly higher than in the outer regions of the galaxy. In this talk, we present the attenuation of emitted neutrino and photon fluxes due to interactions with dark matter particles surrounding supermassive black holes in the host galaxies of AT2019dsg, AT2019fdr, and AT2019aalc. The events have the potential to constrain the dark matter scattering cross-section by ensuring consistency with the observed flux. We also discuss the further applications and future directions of TDEs as a probe of dark matter.

Title of the Poster/Talk

Related Papers/Preprints

https://arxiv.org/abs/2312.11670

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