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Search for dark matter signatures with ANTARES and KM3NeT

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Extraterrestrial neutrinos can be used as messengers to probe the presence of dark matter particles in the Milky Way. Indeed, sizable fluxes of high-energy neutrinos are expected from pair annihilation and decay of dark matter in regions where it accumulates to a high density. Massive celestial bodies such as the Sun and the very large reservoir at the Galactic Centre are inside the field of view of neutrino telescopes installed in the Mediterranean Sea. ANTARES was operated for 16 years and was recently decommissioned, and KM3NeT is currently taking its first data with 10 detection lines for its low energy sub-detector ORCA, and 8 lines for its high energy sub-detector ARCA. A search for signatures of Weakly Interacting Massive Particles (WIMPs) has been performed in 14 years of all-flavour neutrino data, yielding competitive upper limits on the strength of WIMP annihilation. Other non-WIMP landscapes, such as model predicting heavy dark matter candidates, have been tested with dedicated searches in ANTARES data. The current results with the first installed KM3NeT unit will be discussed.

Collaboration name

ANTARES and KM3NeT Collaborations

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