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Searches for dark matter in the Galactic Halo and extragalactic sources with IceCube

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The abundance of dark matter in the Universe could be explained by heavy dark matter. Dark matter is expected to be accumulated near the center of massive astrophysical objects, and the decay of it could produce highly energetic neutrinos detectable at Earth with large neutrino telescopes. The IceCube Neutrino Observatory is a cubic kilometer-scale neutrino telescope located under 1.5 km of ice near the Amundsen-Scott South Pole Station. With the discovery of high-energy astrophysical neutrinos, IceCube has demonstrated the ability to observe neutrinos of extraterrestrial origin. The sources of these astrophysical neutrinos remain largely unknown, making searches for exotic origins very timely. We present an analysis that searches for dark matter decay in extragalactic sources, using nine years of IceCube data. The sources considered are galaxy clusters, dwarf galaxies, and the Andromeda galaxy. We focus on heavy decaying dark matter with masses from 10 TeV to 100 PeV and consider several benchmark decay channels into pairs of Standard Model particles. We use well-established neutrino event selection criteria for neutrino candidate events from the northern sky. In this contribution, we present the latest analysis status and sensitivities calculated using the individual sources and by stacking the sources within the same source class.

Attendance type

In-person presentation

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