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## Search for sterile neutrinos with the IceCube Neutrino Observatory

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The IceCube Neutrino Observatory is a 1 km<sup>3</sup> Cherenkov detector located at the geographic South Pole. It records several tens of thousands of identified atmospheric muon neutrino events per year and has proven to be suitable for the measurement of muon neutrino disappearance due to oscillations. Using similar methods, IceCube allows the search for additional sterile neutrino states with mass differences on the order of 1 eV.

If those sterile neutrino states exist and mix with muon neutrinos, IceCube can measure a deficit compared to the expected neutrino rate in the energy range around one TeV due to strong matter effects in the neutrino propagation through Earth. This survival probability depends on the energy and the path of the neutrino through the Earth and thus its zenith angle. The high statistics and resolutions in the relevant range of energies and baselines make IceCube an ideal tool for testing models of one or more sterile neutrinos.

This work will present the analysis method and results obtained from one year of data taken with the IceCube 59-string configuration.

### Collaboration

IceCube

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