

Searching for signatures of Pseudo-Dirac neutrinos in IceCube data from Astrophysical sources

Friday 19 July 2024 12:00 (15 minutes)

We will present an analysis of IceCube public data from its IC86 configuration, namely PSTRacks event selection, to search for pseudo-Dirac signatures in high-energy neutrinos from astrophysical sources NGC 1068, TXS 0506+056, PKS 1424+240 and GB6 1542+6129 which have been detected with high significance. Neutrino flux from astrophysical sources is reduced in the pseudo-Dirac scenario due to conversion of active-to-sterile neutrinos as compared to the neutrino oscillation scenario of only three active neutrinos over astrophysical distances. We fit IceCube data using astrophysical flux models for these sources in both scenarios and constrain the active-sterile mass-square-difference through a stacking analysis. We also predict ratios of astrophysical neutrinos of different flavors from these sources in the pseudo-Dirac scenario that can be probed in future neutrino detectors such as KM3NeT and IceCube Gen-2.

Alternate track

1. Neutrino Physics

I read the instructions above

Yes

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