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# Probing a four flavor vis-a-vis three flavor neutrino mixing for ultrahigh energy neutrino signals at a 1 km2 detector

We consider a four-flavor scenario for the neutrinos where an extra sterile neutrino is introduced to the three families of active neutrinos and study the deviation from the three-flavor scenario in the ultrahigh-energy (UHE) regime. We calculate the possible muon and shower yields at a 1 km2 detector such as IceCube for these neutrinos from distant UHE sources, e.g., gamma-ray bursts, etc. Similar estimations for muon and shower yields are also obtained for the three-flavor case. Comparing the two results, we find considerable differences between the yields for these two cases. This can be useful for probing the existence of a fourth sterile component using UHE neutrino flux.

## Collaboration name

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