

Tau (and Muon) Airshower on Earth (and Space)

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The neutrino astronomy is polluted by the atmospheric noise up TeVs energy. Anyway Icecube claimed an astrophysical signature (just above a few tens TeV energy), since the 2013. They discovered a sudden increase in the cascade event rate, surprisingly more abundant than the previous TeVs muon neutrino tracks. Such a flavor switch might be also mimicked by an atmospheric charm rising presence. Absent correlations with optical, X, gamma sky of Icecube events it is still puzzling. Nevertheless the eventual tau neutrino appearance, almost absent in any atmospheric noise, (even the charm one), should confirm a neutrino astronomy above PeVs energy. The tau signals are expected by flavor mixing in cosmic flights; they may offer a definitive fingerprint of the astrophysical neutrino nature. These tau neutrino ruling role might rise in ice (IceCube) or water (Antares) as a double bang (first interaction, second tau decay cascades) or by a tau airshower: an internal tau neutrino interaction in the rock of a mountain or of the Earth crust and the later tau decay outside, while in flight in air. The physics of tau airshowers had been noted since 1999 and became today the main road map in widest experimental projects. We discuss and update the tau airshower signature from Earth and planets, by array on top Mountains, Balloons or satellites. Very new ad hoc instruments and novel theoretical expectation will be shown for the first time.

What is your topic?

Future opportunities in Tau Physics

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