

# Flavor And Energy Inference For The High-Energy IceCube Neutrinos And Applications In Quantum Spacetime Models

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## **Abstract content**

I will present a flavor and energy inference analysis (Astroparticle Physics, Volume 101, 2018) for each high-energy neutrino event observed by the IceCube observatory during six years of data taking. For each event the main observables in the IceCube detector are the deposited energy and the event topology (showers or tracks) produced by the Cherenkov light by the transit through a medium of charged particles created in neutrino interactions. Using Bayesian inference and Markov chain Monte Carlo methods I will show how to reconstruct from these observables the properties of the astrophysical neutrino which generated such event. In the end, I will expose briefly, in the context of a multi-messenger astrophysics, an interesting speculation regarding some aspects of IceCube data which may be manifestations of quantum-gravity-modified laws of propagation for neutrinos. A speculation which, as testified by some recent publications (Nat. Astron. 1, 0139, 2017), has attracted an increasing interest.

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