4th Uppsala workshop on Particle Physics with Neutrino Telescopes (PPNT19)



Contribution ID: 5

Type: not specified

Environmentally-induced neutrino decoherence with IceCube/DeepCore, and neutrino oscillation physics prospects with the IceCube Upgrade

Tuesday, 8 October 2019 16:00 (25 minutes)

Neutrino oscillations result from the interference between neutrino quantum states as they propagate. Weak coupling between neutrinos and their environment, including the quantum gravitational structure of spacetime, can modify this interference, resulting in neutrino decoherence and the damping of oscillation probability over distance. This talk will present a search for neutrino decoherence using the IceCube/DeepCore neutrino observatory, which exploits a cubic km of glacial South Pole ice instrumented with over 5000 optical sensors to detect Cherenkov light produced by atmospheric and astrophysical neutrino interactions.

Looking to the future, the recently funded IceCube Upgrade will densely instrument a central region of Ice-Cube with over 700 new optical modules, significantly enhancing low energy neutrino detection where atmospheric neutrino oscillations are observed. Prospects for neutrino oscillations measurements with this new detector will be presented.

Summary

Primary author: STUTTARD, Tom (Niels Bohr Institute, IceCube)

Presenter: STUTTARD, Tom (Niels Bohr Institute, IceCube)