Contribution ID: **170** Type: **Oral**

High Energy Astrophysical Neutrino Flux Measurement Using Neutrino-induced Cascades Observed in 4 Years of IceCube Data

Tuesday 8 August 2017 16:15 (15 minutes)

We report a new measurement of the diffuse flux of high energy extraterrestrial neutrinos from the whole sky with energies of O(1 TeV) and above, that is predominantly sensitive to electron and tau flavors. We analyzed 4 years of IceCube data recorded from 2012-2015 focusing on neutrino-induced cascades. Cascades provide good energy resolution and have a lower atmospheric neutrino background contribution than muon neutrinos. A new event selection has been developed combining straight cuts with gradient boosted multi-class decision trees to isolate cascades with increased efficiency over previous methods, resulting in the largest cascade sample obtained by IceCube to date. Our methods achieve a neutrino purity of better than 90%. At energies above 20 TeV the contribution of muon neutrinos to the total number of expected astrophysical neutrinos in this cascade sample is estimated to be 10%. At these energies the extra-terrestrial component dominates the observed spectrum and is well described by a single, unbroken power-law. We will discuss preliminary fit results and study the possibility of a spectral hardening at the upper end of the spectrum by allowing a second power-law component to enter our flux model.

Authors: Mr NIEDERHAUSEN, Hans (Stony Brook University); Mrs XU, Yiqian (Stony Brook University)

Presenter: Mr NIEDERHAUSEN, Hans (Stony Brook University)

Session Classification: Neutrinos

Track Classification: Neutrinos (astrophysical, atmospheric)