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Observation of Very High Energy Neutrinos in IceCube

Tuesday, 14 May 2013 14:00 (15 minutes)

Observing astrophysical neutrinos provides a unique insight into the acceleration mechanism of cosmic ray sources: neutrinos can only be produced in hadronic interactions and are neither absorbed nor deflected, thus pointing back to their source. The talk will cover hints for an excess of neutrinos above the atmospheric spectrum seen in recent IceCube analyses and discuss the observation of two neutrinos at an energy of about 1 PeV, above the expectation from atmospheric neutrino fluxes. A dedicated all-flavor all-sky search for similar neutrinos at lower energies, down to approximately 100 TeV, will be presented. Using a veto technique selecting for starting tracks and cascade-like events, this analysis is able to suppress the downgoing atmospheric neutrino and muon background, making it possible to lower the energy threshold for the southern sky more than an order of magnitude to below 100 TeV. Assuming the two observed PeV events are from an astrophysical flux, up to several dozen more events are expected and therefore these observations should help to clarify the origin of the PeV flux.

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