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IceCube Starting Events For Diffuse Astrophysical Neutrino Measurements

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The IceCube Neutrino Observatory measures astrophysical and atmospheric neutrinos from the entire sky. The detector array measures Cherenkov light emitted when neutrinos interact in the ice and produce charged leptons. The presence of astrophysical neutrinos has been established by the High Energy Starting Events (HESE) selection. HESE measures these astrophysical neutrinos at energies above 60 TeV using a veto-based selection. At energies lower than 60 TeV this event selection is dominated by atmospheric muons and neutrinos. In this talk, we present the Medium Energy Starting Event (MESE), that utilizes additional veto techniques to further suppress atmospheric muons at lower energies for starting events. This veto of muons also helps in reducing the rate of atmospheric neutrinos that accompany these muons, especially in the Southern sky. The MESE sample uses neutrinos with energies above 1 TeV to measure the all-sky astrophysical spectrum using 11.3 years of data. The dataset includes neutrinos of all flavours from both the Southern and the Northern Hemisphere, and is therefore also used to measure the astrophysical flavour ratio of neutrinos.

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