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

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We report a new measurement of the diffuse flux of high energy extraterrestrial neutrinos from the whole sky with energies of  $O(1 \text{ TeV})$  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.

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