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The Flavour Composition of High Energy Neutrinos in IceCube

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The recent detection of 37 high-energy neutrinos of astrophysical by the IceCube experiment at the South Pole has signalled the beginning of high-energy neutrino astronomy. At these energies, neutrinos are expected to be produced by pion disintegration after production in high-energy sources. This should lead to a democratic flavour composition at Earth of (1:1:1) electron : muon : tau neutrinos. We present our analysis of the observed flavour composition of the IceCube events, based on the event topology and energy spectra, with a critical eye on the canonical (1:1:1). We demonstrate that current observations hint at some compelling puzzles, notably the lack of lower-energy muon neutrinos, as well as an absence of observed events in the expected Glashow resonance peak above 3 PeV.

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