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End to the Cosmic Neutrino Spectrum?

There exists a seeming high-energy cutoff of neutrino events in IceCube data. In particular, IceCube does not observe the Standard Model Glashow-resonance events expected at 6.3 PeV. There are also no higher-energy neutrino signatures in the ANITA and Auger experiments. This absence of high-energy neutrino events motivates models having a fundamental restriction on neutrino energies above a few PeV. The simplest scenario to terminate the neutrino spectrum is the Lorentz-Invariance violating, limiting neutrino velocity formulated by Coleman and Glashow in 1998. Either the neutrino itself, or its parent charged-pion, can be assigned a maximal velocity. In an alternative mechanism, we may postulate that the pion becomes stable above some velocity. Implications of these hypotheses for other physics, beginning with the end of hope for UHE neutrino astronomy, can hardly be overstated. Testable repercussions will be outlined in this presentation. Of course, the hypothesis of a cutoff near the PeV energies of the current trio of IceCube events can be invalidated by observation of higher-energy neutrinos.

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