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**The Effect of a Maximum Lepton Energy on the Stability of Pions and Cosmic Ray Physics** PETER DENTON, Vanderbilt University, DANNY MARFATIA, University of Hawaii, THOMAS WEILER, Vanderbilt University — The IceCube experiment has detected astrophysical neutrinos with energies in the 10 TeV to 2 PeV range. Extrapolating the measured power-law spectrum beyond 2 PeV, a few higher energy continuum events and a few events at the Glashow resonance energy of 6.3 PeV are predicted but not observed. Recently, it was postulated that the reason for the apparent energy cutoff in the IceCube neutrino data is because Nature has provided an absolute maximum energy for neutrinos. Since the charged pion decays to leptons, energy cutoffs for the leptons in turn imply that the lifetime and mean free path of the pion increase, eventually reaching absolute stability. We calculate the lifetime of the charged pion under these assumptions and discuss its role in ultra high energy cosmic ray physics.

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