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High-energy neutrino interactions: first cross section measurements at TeV and above

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Neutrino interactions, though feeble, are tremendously important in particle physics and astrophysics. Still, at neutrino energies above ~ 350 GeV there has been, up to now, no direct experimental information on neutrino interactions; calculations rely on extrapolations from lower energies. Now, for the first time, we can measure the neutrino-nucleon cross section at the TeV scale and above, thanks to the recent discovery, by IceCube, of high-energy astrophysical neutrinos. We will show new cross section measurements extracted from the 4-year sample of IceCube High Energy Starting Event showers between 20 TeV and 2 PeV. The measurements agree with standard cross-section calculations and constrain new physics beyond the Standard Model at these energies.

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