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Development of Telescopes for Extremely Energetic Neutrinos

Dedicated high energy neutrino telescopes based on optical Cherenkov techniques have been scanning the cosmos for about a decade. At TeV scales, limits on the diffuse flux have improved by several orders of magnitude, eliminating the most optimistic models that tend to be normalized to the extragalactic x-ray and gamma-ray backgrounds. At higher energies, neutrino telescopes have provided the first flux limits from point sources and diffusely distributed sources such as cosmogenic neutrinos generated by the GZK process. Moreover, the diffuse flux limits can be used to constrain the flux from extragalactic point sources. To substantially improve the experimental capabilities at the very highest energies, new techniques are required. I will briefly discuss several radio and acoustic-based detectors that promise to increase the sensitivity to neutrinos with energies in excess of 10^17 eV. These telescopes have already ruled out some of the more exotic predictions for neutrino intensity. In addition to flux measurements, these devices can probe for non-standard particle physics by investigating the neutrino cross-section.

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