

Radio Askaryan Neutrino Telescopes

Tuesday, 27 August 2013 10:00 (30 minutes)

There are strong motivations for a detectable flux of ultra-high energy (UHE) cosmic neutrinos above 10^{17-18} eV both from cosmic ray interactions with cosmic microwave background photons and directly from UHE sources. The radio Cerenkov technique is the most promising technique for instrumenting a detection volume large enough to detect the low expected fluxes, and so far all experiments in the field use Antarctic ice as their detection medium due to its immense volume and clarity at radio/microwave frequencies. All current and future projects either view the ice using antennas flown at high altitudes, or use antennas embedded in the ice itself. The world's best constraints on neutrino fluxes above 10^{18} eV come from RICE, embedded in the ice near the South Pole, and ANITA, a balloon-borne experiment that is launched under NASA's long duration balloon program. I will review the status of past and current experiments in the field, as well as current and future experiments ARA, ARIANNA and EVA. I will also touch on the implications of future UHE neutrino measurements for particle physics and particle astrophysics.

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