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Antineutrino detection & technology overview

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Since the successes of the Daya Bay, Double Chooz and RENO ⊠_13 experiments in the early 2000s, antineutrino detection technologies have continued to evolve, providing new capabilities such as next generation scintillating materials, photon detectors and new dual phase TPC techniques. Some of these technologies are being employed in detectors coming online now. Most recently, above ground detection of reactor antineutrinos, which relies upon the identification of cosmogenic fast neutrons to reduce the most prevalent backgrounds, was accomplished using pulse shape sensitive scintillator or innovative new designs that permit improved topological reconstruction of complex event structures. Speculating on future developments, we can look forward to capabilities such as improved aboveground sensitivity, and shallower deployment requirements in general. Further advances will come from order of magnitude improvements in vertex resolution, higher photon detection efficiencies, more stable and less toxic materials, and better particle ID. Separately, coherent scattering detection remains an elusive but potentially attractive solution due to the relatively high interaction cross section. Many of the new technologies described here will have important implications for applications in the future. In this talk I will survey technologies and techniques being developed now, and project how they may improve capabilities for applications in the future.

Abstract title

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