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ANNIE: the Accelerator Neutrino Neutron Interaction Experiment

Friday 25 August 2023 17:30 (20 minutes)

The Accelerator Neutrino Neutron Interaction Experiment (ANNIE) is a Gadolinium-loaded water Cherenkov detector placed in the Booster Neutrino Beam (BNB) at the Fermi National Accelerator Laboratory, USA. The primary physics goal of ANNIE is to perform neutrino cross-section measurements that will constrain systematic uncertainties in the next generation of long-baseline neutrino experiments. The first measurement will be the multiplicity of final-state neutrons from neutrino-nucleus interactions in water. Alongside these measurements, ANNIE has achieved the first ever deployments of two novel detector technologies in a neutrino beam: Large Area Picosecond Photodetectors (LAPPDs) and Water-based Liquid Scintillator (WbLS). LAPPDs are micro-channel-plate-based devices that provide timing resolution of ˜100 picoseconds and sub-centimeter spatial resolution. WbLS combines the low attenuation and Cherenkov production of pure water with the high light-yield and low detection threshold of liquid scintillator. This talk will discuss the status of ANNIE's physics and R&D measurements.

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