

The ANNIE Experiment

In this poster we present the Atmospheric Neutrino Neutron Interaction Experiment (ANNIE) designed to measure the neutron yield of atmospheric neutrino interactions in gadolinium-doped water. It is a small, dedicated experiment designed to make this measurement using a beamline with known characteristics. This measurement will help in reducing the background from atmospheric neutrino interactions in proton decays.

The neutron tagging techniques based on such measurement will also be useful to a broader program of physics beyond proton decay as supernovas and neutrino interaction models.

An innovative aspect of the ANNIE design is the use of precision timing to localize interaction vertices in the small fiducial volume of the detector. We propose to achieve this by using early prototypes of LAPPDs (Large Area Picosecond Photodetectors). This experiment will be a first application of these devices demonstrating their feasibility for WCh neutrino detectors. The ideas explored by ANNIE could have a transformative impact on water Cherenkov, scintillation, and other photodetection-based neutrino detector technologies.

WG3: Accelerator Physics (Yes/No)

No

WG2: Neutrino Scattering Physics (Yes/No)

Yes

WG4: Muon Physics (Yes/No)

No

WG1: Neutrino Oscillation Physics (Yes/No)

Yes

Type of presentation

Poster

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