

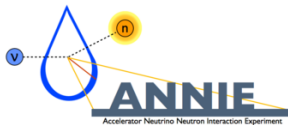
ANNIE experiment - Update and status

AEM - July 11th, 2016

Vincent Fischer

University of California, Davis

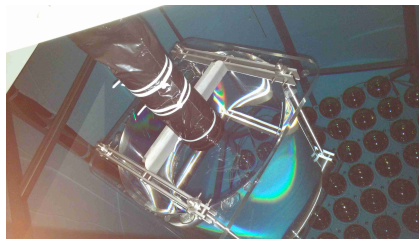
July 11th, 2016



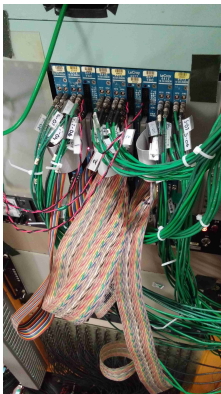
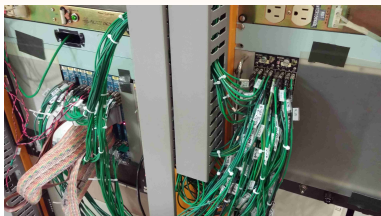
UC DAVIS
UNIVERSITY OF CALIFORNIA

New PMT installation

- Small PMT installed on top of the NCV
- Acts as a trigger to tag energy depositions in the NCV
- Encased in a watertight acrylic tube made at UC Davis
- Replaces one of the two dead channels
- Very low noise and large efficiency
- Will strongly reduce cosmic background



MRD and veto DAQ



- So far, we only had triggers from the veto and MRD layers (through chained discriminators)
- Goal: Retrieve hit information per channel (PMT paddle)
- TDCs connected to the discriminators to retrieve the time information of a hit
- Required amplification of veto and MRD layer 3 signals
- Beam trigger information sent from the trigger board to the CAMAC TDCs

Neutrino 2016

- A lot of ANNIE collaborators were present at Neutrino 2016
- 2 very well-received posters:
 - Carrie McGivern (Iowa State)
 - Marcus O'Flaherty (Sheffield, UK)
- ANNIE has been mentioned several times

Neutrino 2016



The ANNIE Experiment

Carrie McGivern
Iowa State University, for the ANNIE Collaboration



Accelerator Neutrino-Neutron Interaction Experiment

ANNIE is a water Cherenkov neutrino experiment in Fermilab's Booster Neutrino Beamline.

GOAL: to measure the abundance of final state neutrons from neutrino-neutron interactions.

Physics topics: neutrino-neutron interactions, neutrino-neutron cross-sections, neutrino-neutron interaction models.

ν-Nuclei Interactions?

To learn more about neutrino-neutron interactions, we need to understand the complex world of neutrino-neutron interactions.

Physics topics: neutrino-neutron interactions, neutrino-neutron cross-sections, neutrino-neutron interaction models.

ANNIE Run 1

Run 1 of ANNIE is currently taking data. It is currently taking data for Run 1 of ANNIE.

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Run II Detector System

Run II of ANNIE is currently taking data. It is currently taking data for Run II of ANNIE.

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Physics Impact

Neutrino Energy Reconstruction

Energy reconstruction will be essential for ANNIE. Energy reconstruction will be essential for ANNIE.

Proton Decay

Proton decay is a key topic for ANNIE. Proton decay is a key topic for ANNIE.

Supernova Neutrinos

Supernova neutrinos are a key topic for ANNIE. Supernova neutrinos are a key topic for ANNIE.

Cross Sections in Water

Cross sections in water are a key topic for ANNIE. Cross sections in water are a key topic for ANNIE.

LAPPDs

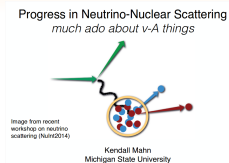
Large Area Picosecond Photodetector

LAPPDs are a key technology for ANNIE. LAPPDs are a key technology for ANNIE.

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Neutrino 2016



Kendall Mahn



Sara Bolognesi



Recent Results From MINERvA
Laura Fields

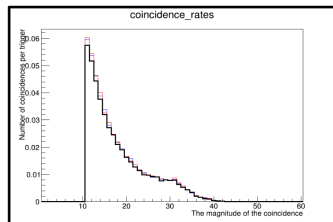
Laura Fields

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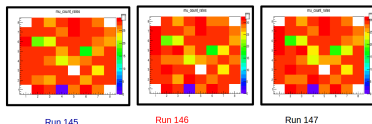
Data analysis

- Several students at Fermilab for the summer working on data analysis
- Automated diagnosis plots generated for each run
- Changes made in the data files processing to allow more efficient analysis

Coincidence Rate



Muon Count Rates



What's next ?

- Continue taking beam data until the BNB shutdown
- Data taking will continue after the shutdown (cosmics, LED calibration)
- More manpower working on analysis

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Thank you for your attention !