Title: FINeSSE, A Neutrino Scattering Experiment (U)

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FINeSSE, a neutrino scattering experiment

(1) Physics
- neutrino-nucleon elastic scattering, \( \Delta \nu \)
- other neutrino scattering processes (CCQE, CCp, NCp)
- neutrino-oscillations (requires a "far" detector)

(2) What is \( \Delta \nu \)?
Strange quark spin component in the nucleon

(3) Why \( \nu \text{NC} \)?
Information about \( \Delta \nu \) exists in the isoscalar part of the axial form factor and low-\( Q^2 \) \( \nu \) scattering is most sensitive to axial form factor, so a measurement of \( \nu \text{NC} \) scattering yields \( \Delta \nu \).

(4) Why SIBATH?
Low-\( Q^2 \) scattering is high angle event

A prototype detector was tested using the 200MeV proton beam at the Indiana University Cyclotron Facility with Liquid Scintillator (BC-517H) blue to green fiber: BCF-91A

Using the neutrino beam as probe of nucleon structure.

**FINeSSE detector**

The Vertex Detector...
- to precisely track low-energy protons
- (2.5m\(^2\)) active liquid scintillator volume
- 19200 (60x60x3) 1.5 mm VLS fibers on 3cm spacing with 3 orientations
- 16ch MAPMT

The Muon Rangestack...
- to track and measure the energy of muons

**Prototype beam test**

Test Results: 17±2 PEps/fiber for near tracks

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