Contribution ID: **116** Type: **not specified**

Results from a scintillator test deployment in SNO+

The SNO+ liquid scintillator neutrino experiment is under construction in the SNOLAB facility, located approximately 2 km underground in Sudbury, Ontario, Canada. The goals of this multi-purpose experiment include precision measurements of low energy components of the solar neutrino flux and a search for the elusive neutrinoless double beta decay process through addition of neodymium in a separate phase of the experiment. A detailed understanding of the linear alkyl benzene (LAB) scintillator and its optical properties is crucial to the success of this experiment.

To this end, an acrylic cylinder capable of holding approximately 1 litre of scintillator was deployed in a water filled SNO+ detector in autumn 2008. By deploying the cylinder with an Americium Beryllium (AmBe) source (external to the cylinder), the scintillator light yield was determined in the actual detector, helping to tune the detector Monte Carlo.

The cylinder was deployed without the AmBe source to search for background contamination using a beta-alpha coincidence method. Alpha peaks from radon were used to derive Birks' constant and alpha quenching factors. The beta-alpha coincidence events were used to provide a sample of betas and alphas which were used in timing and pulse-shape discrimination studies. Three different types of LAB scintillator were studied during the test deployment, including LAB loaded with 0.1% natural neodymium. This poster will present the design of the apparatus, preparation of the scintillator samples, results from this small scale test and their implications for the SNO+ experiment.

This work is presented on behalf of the SNO+ collaboration.

Primary author: Dr O'KEEFFE, Helen (Queen's University, Kingston)

Co-authors: Dr KRAUS, Christine (Laurentian University, Sudbury); Dr WAN CHAN TSEUNG, H.S. (University of Washington); Dr WILSON HAWKE, Jeanne (Queen Mary, University of London)

Presenter: Dr O'KEEFFE, Helen (Queen's University, Kingston)