

Alpha and Beta Discrimination in SNO+ in Partial Fill and Scintillator Full Phase

SNO+ is one of SNOLAB's neutrino focused detectors, and is located 2km underground at Vale's Creighton Mine, in Sudbury, ON. The detector itself is composed of a spherical acrylic vessel (AV) that has a radius of 6m, which is currently in a period of holding liquid scintillator - linear alkylbenzene (LAB) and PPO (wavelength shifter), before it is loaded with Tellurium-130. The AV is centered and held in position within a geodesic shell of photomultiplier tubes, which are all submerged within a cavity containing UPW. The experimental set-up allows for the detection of scintillation light produced by particle interactions with LAB. Although the AV has been filled with scintillator, background analysis must be conducted for the period where scintillator fill was ongoing.

The experiment's primary physics goal is conducting the search for neutrinoless double beta decay. Additional physics goals include: invisible nucleon decay in UPW, solar neutrino studies (proton-electron-proton (pep) and carbon-nitrogen-oxygen (CNO)), geo- and reactor- antineutrino studies, and potential observation of neutrinos from a nearby supernova.

In this presentation, I will introduce SNO+ and its physics program, and then discuss one specific example of a background study involving pulse shape discrimination for the partial fill phase.

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