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83 - AmBe Source Calibrations in Measuring Reactor Antineutrinos in SNO+ Water Phase

Tuesday, June 4, 2019 5:33 PM (2 minutes)

SNO+ is a multipurpose neutrino detector located approximately 2 km underground in SNOLAB, Sudbury, Ontario, Canada. The first phase of the experiment, running with ultrapure water, is now concluded and one of the goals is to detect reactor antineutrinos. Neutrino physics is answering important questions about the structure and behaviour of our universe, including our understanding of neutrino oscillations and masses. During the water phase a radioactive source producing neutrons (241AmBe) was deployed and the calibration data analysed. A key component of an anti-neutrino signal (or neutron) is the identification of the 2.2 MeV "gamma" from the inverse beta decay neutron capturing on hydrogen. The low trigger threshold allows for a substantial detection efficiency of these neutrons.
An in depth analysis of the neutron capture efficiency and transit time between events will allow SNO+ to trigger on and identify antineutrino signals. This presentation the analysis of the AmBe calibration data and the extraction of the neutron capture efficiency for the SNO+ detector with ultrapure water.

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