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The AmBe source for the SNO+ detector calibration

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Uncovered mysteries about neutrinos bring us deep underground to answer questions about the Universe. SNO+ is a multipurpose experiment situated at the SNOLAB facility located at Creighton mine 2km deep. The SNO+ experiment has three phases: water, pure scintillator and Te loaded scintillator. With this scintillator filled detector, solar neutrinos, geo and reactor anti-neutrinos, even supernova neutrinos can be studied. To analyze the data collected by the detector, it is important to have detailed knowledge of the detector response. This is why calibration is a crucial part of the experiment. The detector response to neutrons will allow us to study the anti-neutrino flux coming from reactors in Canada. Anti-neutrinos can be detected via inverse beta decay reaction which can be tagged using neutrons it produces. This presentation will discuss the radioactive calibration source Americium Beryllium (AmBe) which produces neutrons and gammas. The existing AmBe source - inherited from the SNO experiment - will be used in water phase has to be modified for the scintillator and loaded scintillator phases. Simulations were carried out to determine the optimal additional shielding required for the scintillator phase. The results of the simulation and general overview over the AmBe source and its use for SNO+ will be discussed.

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