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Neutron detection in the water phase of SNO+ experiment

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Efficient detection of neutrons in water is important because of its physics applications. For example, neutron detection could enable the detection of neutrinos via inverse beta decay or help suppress neutron-accompanied backgrounds. However, observing neutrons in pure water Cherenkov detectors is a challenging task due to the low energy of the 2.2 MeV gamma emitted upon capture. SNO+ is a multipurpose neutrino experiment that began taking data with pure water in May, 2017, and will soon begin filling scintillator. A first observation of reactor neutrinos in water may be achievable with the low trigger threshold of the SNO+ detector. We present studies of neutron detection in the SNO+ experiment based on an AmBe calibration source.

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