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Invisible Nucleon Decay in SNO+

The SNO+ experiment aims to explore several topics in neutrino physics, including neutrinoless double beta decay and low energy solar neutrinos. This will use the existing Sudbury Neutrino Observatory (SNO) detector, replacing the heavy water with liquid scintillator. Upgrades have been made to the electronics to deal with the lower thresholds and higher data rates expected and a hold-down rope net has been installed to support the inner vessel in position.

For its initial commissioning phase, SNO+ will fill its inner vessel with light water and run to evaluate the performance of the detector and electronics. During this water-fill phase, it will have a unique model independent sensitivity to certain modes of invisible nucleon decay, in which the nucleon decays to a mode in which the decay products are not detected, e.g. $n \rightarrow 3\nu$. With just a couple of months of water running, SNO+ is expected to set an improved limit on the current bounds.

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