

## Search for Invisible Nucleon Decay in the SNO+ Experiment

SNO+ is a multipurpose, large-scale neutrino experiment located deep underground in Sudbury, Ontario, whose aims include studies of neutrinoless double beta decay, solar neutrinos, reactor neutrinos and other more exotic physics. SNO+ is currently taking data in its initial water-fill phase, which will be used to commission upgrades to the electronics and calibration sources. During this phase, SNO+ has a unique sensitivity to certain invisible modes of nucleon decay, in which the nucleon decays to some undetected final state, such as  $n \rightarrow 3\nu$ . Nucleon decay in  $O16$  can lead to excited states of  $O15$  or  $N15$  which will deexcite, emitting a gamma which can be detected.

The current limits on this model-independent mode are from SNO and Kamland. However, SNO+ can improve upon these in its relatively short water phase as SNO's use of  $D2O$  brought higher backgrounds from the neutral current events while Kamland's limit suffers from the lower branching ratio to a visible signal in carbon. The major backgrounds to this search will come from solar and reactor neutrinos and radioactivity from the U and Th chains. With just 3 months of data taking, SNO+ expects to achieve world-leading sensitivity to these modes.

**Primary authors:** Dr COULTER, Ian (University of Pennsylvania); LABE, Kevin (University of Chicago)

**Presenters:** Dr COULTER, Ian (University of Pennsylvania); LABE, Kevin (University of Chicago)

**Session Classification:** Poster Session

**Track Classification:** Neutrinos