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The Sudbury Neutrino Observatory: Past, Present and Future

JARET HEISE[1], Queen's University/Sudbury Neutrino Observatory

The Sudbury Neutrino Observatory (SNO) is a 1000-tonne heavy-water Cherenkov detector situated 2 km underground in INCO's Creighton mine near Sudbury, Ontario, Canada. The third phase of operation finished in November 2006, completing the physics program for the experiment. Results from the first two phases will be summarized and details of the third phase which employs an array of low-radioactivity proportional counters will be discussed in addition to topics relating to detector decommissioning.
The laboratory that currently houses the SNO experiment is undergoing an expansion to become SNOLAB, an international facility that is in an advanced stage of construction and will soon provide twice the space available for deep underground experiments over the existing SNO installation. SNOLAB will host the next generation particle-astrophysics experiments in pursuit of low-energy solar neutrinos, neutrinoless double beta decay, cosmological dark matter and supernova neutrinos.
One such experiment is the successor to SNO called SNO+, which is proposing to use liquid scintillator in place of heavy water to study low-energy *pep* and CNO solar neutrinos and potentially geo-neutrinos originating from radioactivity in the Earth. A second phase of the experiment would allow sensitivity to neutrinoless double beta decay by adding ^{150}Nd to the liquid scintillator target volume. Aspects of SNOLAB and SNO+ will also be presented.

[1]on behalf of the SNO Collaboration