

Constraints on Nucleon Decay via “Invisible” Modes from the Sudbury Neutrino Observatory[1]

K.T. Lesko¹, Y.D. Chan¹, K.M. Heeger², A.D. Marino¹, E.B. Norman¹, A.W.P. Poon¹, and R.G. Stokstad¹ *for the SNO Collaboration*

¹*Institute for Particle and Nuclear Astrophysics, Nuclear Science Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720*

²*Physics Division, Lawrence Berkeley National Laboratory, Berkeley, California 94720*

Data from the Sudbury Neutrino Observatory have been used to constrain the lifetime for nucleon decay to “invisible” modes, such as $n \rightarrow 3\nu$. The analysis was based on a search for γ -rays from the de-excitation of the residual nucleus that would result from the disappearance of either a proton or neutron from ^{16}O . A limit of $\tau_{\text{inv}} > 2 \times 10^{29}$ years is obtained at 90% confidence for either neutron or proton decay modes. This is about an order of magnitude more stringent than previ-

ous constraints on invisible proton decay modes and 400 times more stringent than similar neutron modes.

[1] TheSNOCollaboration, Phys. Rev. Lett. **92**, 102004 (2004).