

Searches for Nucleon Decay at Hyper-Kamiokande

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While grand unified theories offer potential solutions to problems with the Standard Model, such as the origins of charge quantization, their signature prediction, proton decay, has not been observed experimentally. Hyper-Kamiokande is a next-generation water Cherenkov experiment with a 187 kton target volume that will provide unprecedented sensitivity to a variety of nucleon decay modes, including many beyond the so-called flagship modes, $p \rightarrow e^+\pi^0$ and $p \rightarrow \bar{\nu}K^+$. With improved detector technologies to enhance signal efficiencies and reject backgrounds, Hyper-Kamiokande is expected to search for these processes with sensitivities to proton lifetimes of 10^{35} years and longer, providing opportunities for discoveries for lifetimes exceeding existing limits by an order of magnitude. This presentation will describe the complete Hyper-Kamiokande nucleon decay physics program and its expected sensitivities.

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