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Search for Invisible Modes of Nucleon Decay with the SNO+ Extended Water Data

Many Grand Unified Theories predict processes that would allow baryons to decay to leptons, violating baryon number conservation and subsequently allowing for both protons and neutrons to decay through non-Standard Model interactions. Distinct from the high energy decay modes that very large water Cherenkov detectors are designed to look for are so-called invisible decays which are only detectable through their subsequent nuclear deexcitations. The SNO+ experiment is uniquely sensitive to this mode of decay due to its low energy threshold, low background radiation, and detector depth. Presented here are updated results using a second dataset which triples the total livetime with nearly 200 days of very low background.

Mini-abstract

SNO+ presents phase II water results on a search for invisible modes of nucleon decay.

Experiment/Collaboration

SNO+

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