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Status and Prospects of SNO+ Experiment

Tuesday 5 December 2023 15:10 (20 minutes)

SNO+ aims to detect the neutrinoless double beta decay ($0\nu\beta\beta$) signals of $\text{Te}130$, which, if observed, would prove neutrinos are Majorana particles that violate lepton number, providing strong evidence for physics beyond the Standard Model, and shed light on the origin of matter over antimatter in the Universe. Between 2017 - 2019, SNO+ took data in the water phase, during which it obtained world-leading limits on invisible nucleon decay and achieved the first detection of reactor antineutrinos using pure water. Currently, SNO+ is running its liquid scintillator phase, which allows us to measure the internal radioactivity of the scintillator and external backgrounds for the search of $0\nu\beta\beta$, and enables us to measure geoneutrinos, reactor neutrinos, solar neutrinos, atmospheric neutrinos and potential supernova neutrinos in a wide energy range. Loading Te in the liquid scintillator is in preparation, and the exciting Te data taking will start in 2025. Sensitivity for the effective Majorana neutrino mass near or into the parameter space allowed by inverted neutrino mass ordering can be expected.

Name of collaboration or list of co-authors

SNO+ Collaboration

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Session Classification: Tuesday after lunch