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Neutrinoless double beta decay: status and prospects of searches with liquid scintillator detectors

The discovery of neutrinoless double beta decay would have a far-reaching impact, so its search is a key goal of neutrino physics. It is also a rich experimental field where several experimental strategies have been employed and are being developed for the future. After a brief summary of motivations and an overview of the most recent results, this talk will focus on one of the leading techniques, that of employing large liquid scintillator detectors. Allowing very large masses of isotope, low intrinsic backgrounds and several background reduction strategies, liquid scintillator detectors have many advantages for neutrinoless double beta decay searches, that have been demonstrated by the achieved sensitivity of the KamLAND-Zen experiment, with Xenon. The SNO+ liquid scintillator experiment is taking data at SNOLAB and has been developing the use of natural Tellurium for its upcoming double beta decay phase, which is expected to push the sensitivity with Te-130 and pave the way for future higher-loading (and higher mass) developments.

After describing the current status and future prospects of KamLAND-Zen and SNO+, the talk will also cover ideas for future experiments employing the liquid scintillation technique.

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