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A New ^{82}Se detector for Neutrinoless Double Beta Decay Searches

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$N\nu\text{DEX}$ (No neutrino Double-beta-decay Experiment) is a new Se-based TPC detector that will be placed in China Jinping Underground Laboratory (CJPL) looking for neutrinoless double beta decay. $N\nu\text{DEX-100}$, the experiment phase with 100 kg of SeF_6 gas, is currently being built and planned to be completed with installation at CJPL around the year 2025. I will present the current status of the experiments and the perspectives for future developments.

SeF_6 has very high electronegativity; for this reason, the electrons will recombine very quickly and the particles traveling toward the readout plane will be negative ions. A new kind of sensor, Topmetal-S, has been developed: it will allow us to read out the drifted charge and reconstruct the energy of the event with great precision even without physical amplification like electron avalanche.

The main advantages offered by $N\nu\text{DEX}$ are two: firstly, the large rock overburden would decrease significantly the cosmogenic muon background. Second, the high Q-value of ^{82}Se (~3 MeV) will place the Region Of Interest above the energy range of the large majority of the environmental gamma's, allowing us to achieve an incredibly low-background environment, which ensures excellent perspectives for scalability.

Submitted on behalf of a Collaboration?

Yes

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