

NvDEx - A Se TPC detector for neutrinoless double beta decay

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NvDEx is a new Se-based TPC detector that will look for neutrinoless double beta decay. It will be placed in China JingPing Underground Laboratory, where the large rock overburden (2.4 km) will suppress significantly the cosmogenic background. Moreover, the high Q-value of ^{82}Se , 2.996 MeV, will place the ROI well above most of the environmental background. As a result, it will be possible to achieve an incredibly low background environment, which ensures excellent perspectives for scalability.

NvDEx-100, the first phase of the experiment using 100 kg of SeF_6 gas, is currently under construction and planned to start taking data in 2026. I will present the current status of the experiment and the perspectives for future developments.

One of the main challenges to overcome is the high electronegativity of SeF_6 , which means that 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.

Poster prize

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