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Status and Prospects of NvDEx, a Se TPC detector for 0n2b decays

NvDEx (No Neutrino Double beta decay Experiment) is a Se TPC detector that will be located in China Jinping Underground Laboratory (CJPL), looking for neutrinoless double beta decays. In this talk, I will present the current status of the experiment and the prospects for future developments. The first phase of the experiment will be NvDEx-100, using 100 kg of SeF₆: due to the large overburden (2,400 m rock) and the high Q-value of 82 Se (2.996 MeV) the background rate will be very low, which ensures excellent prospects for scalability. On the other hand, since SeF₆ is an electronegative gas, any free electron will be captured almost immediately, and negative ions will be drifting in the chamber, which prohibits the use of traditional electron-sensing TPC detectors. For this reason, a new kind of chip has been developed: it will allow us to observe the negative ions and reconstruct the energy of the events with great precision, even without electron avalanche multiplication. A third tapeout of the chip (V2) has been produced and it's currently being tested using a prototype TPC on the surface. The tracks of alpha particles were successfully detected during the test and the equivalent noise charge was measured to be about 58e⁻, approaching the requirement of 45e⁻.

Secondary track

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