

Barium tagging in NEXT: toward an ultra-low background $0\nu\beta\beta$ decay detector.

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Neutrinoless double beta decay experiments are pushing their sensitivities to reach half-lives on the order of 10^{28} years. A promising approach involves detecting the daughter ion generated in the decay. The NEXT collaboration is testing chemical sensors to identify the Ba^{2+} ion produced in the double beta decay of ^{136}Xe , coinciding with the emission of two electrons. This entails a challenge, since only a few ions per year would be produced in the NEXT chamber. Further the chemosensors must be compatible with the ultra-dry conditions of xenon. The R&D effort in NEXT towards Barium tagging is two fold: First, to build a Single-Molecule Fluorescence Imaging (SMFI) system with enough sensitivity to detect the signal from the chemosensors and capable of operating under a dry environment. Second, to develop a barium source reproducing the conditions of the NEXT detector. This two systems will be integrated to compose a reliable Barium-tagging sensor.

Alternate track

1. Detectors for Future Facilities, R&D, Novel Techniques

I read the instructions above

Yes

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