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R&D toward future barium tagging phases of the NEXT program

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The NEXT collaboration is pursuing a phased program to search for neutrinoless double beta decay ($0\nu\beta\beta$) of ^{136}Xe using high pressure xenon gas time projection chambers. The power of electroluminescent xenon gas TPCs for $0\nu\beta\beta$ derives from their excellent energy resolution ($<1\%$ FWHM), and the topological classification of two electron events, unique among scalable $0\nu\beta\beta$ technologies. Xenon gas detectors also offer a further opportunity: the plausible implementation of single barium daughter ion tagging, an approach that may reduce radiogenic and cosmogenic backgrounds by orders of magnitude and unlock sensitivities that extend beyond the inverted neutrino mass ordering. This talk will cover advances in the development of single ion barium tagging for high pressure xenon gas detectors and summarize R&D towards large scale future phases of the NEXT program.

In-person participation

Yes

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