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nEXO: a multi-ton detector for neutrino less double-beta decay

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The EXO collaboration is designing a 5-ton liquid enriched-xenon TPC to search for neutrinoless double-beta decay, to be called nEXO. nEXO will have the sensitivity to rule out the inverted hierarchy. While the detector is designed to have a very low intrinsic background, the design will accomodate, as a possible upgrade, a system to recover and identify the barium daughter nucleus. This barium tagging system would allow a background-free measurement of neutrinoless double-beta decay and increase the half-life sensitivity of the experiment by at least an order of magnitude. Ongoing research and development includes a system designed to test extraction of barium from liquid xenon using Resonance Ionization Spectroscopy (RIS).

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