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Progress in Imaging of Barium Atoms in Solid Xenon at CSU[1]
JAMES TODD, DAVID FAIRBANK, Colorado State University, CHRIS CHAMBERS, McGill University, WILLIAM FAIRBANK, Colorado State University, NEXO COLLABORATION — Interest in neutrinoless double beta decay searches has increased in recent decades to probe whether the neutrino is its own anti-particle or not. Recent searches in enriched liquid Xenon have occurred in the EXO experiment, with plans to achieve greater sensitivity in a ton-scale detector in the nEXO experiment. In liquid 136Xe, double beta decay leaves behind a daughter barium atom. If this daughter can be identified and tagged, the only remaining background in the detector will be $2\nu\beta\beta$ decay. To this end, imaging techniques of barium in solid xenon (SXe) are being developed and improved at Colorado State University that utilize scanning a focused laser beam over the Ba and SXe deposit. Images of individual barium atoms in different SXe matrix sites will be presented, and progress toward imaging of individual Ba+ ions in SXe will be reported.

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