Contribution ID : **32** Type : **not specified**

Single Barium Atom Detection in Solid Xenon for the nEXO Experiment

Tuesday, 16 July 2019 16:00 (20)

The proposed nEXO experiment is a tonne-scale liquid xenon time projection chamber, designed to search for neutrinoless double beta decay in xenon-136 [1]. A critical concern for any rare decay search is reducing or eliminating backgrounds that will interfere with the signal [2]. A powerful background discrimination technique is the positive identification ("tagging") of the decay daughter, in this case barium.

A technique being developed in the nEXO collaboration is the trapping and extraction of the Ba daughter ion in solid xenon on a cryogenic probe, then using fluorescence spectroscopy to tag, i.e., identify the barium atom. Individual barium atoms, implanted into Xe ice as Ba ions, have been imaged in solid xenon, and the 619 nm emission of atomic barium in solid xenon has been assigned to single vacancy trapping sites [3].

1. Al Kharusi et al. (nEXO Collaboration), arXiv:1805.11142 *[physics.ins-det]* (2018).
2. Albert et al. (nEXO Collaboration), *Phys. Rev. C* **97**, 065503 (2018).
3. Chambers et al. (nEXO Collaboration), *Nature* **569**, 203-207 (2019).

Primary author(s) : Dr CHAMBERS, Christopher (McGill University)

Co-author(s) : Mr FAIRBANK, David (Colorado State University); Mr TODD, James (Colorado State University); Prof. FAIRBANK, William (Colorado State University)

Presenter(s) : Dr CHAMBERS, Christopher (McGill University)