

Workshop on Xenon Detector $0\nu\beta\beta$ Searches: Steps Towards the Kilotonne Scale

Contribution ID: 61

Type: **Invited talk**

Imaging of Ba/Ba⁺ in Xe ice

Thursday, 26 October 2023 14:15 (25 minutes)

Our group in the nEXO collaboration is developing a cryogenic method for Ba daughter tagging in neutrinoless double beta decay in liquid ^{136}Xe . The principle is to capture the Ba daughter from liquid xenon by trapping it in a solid xenon layer on a cryogenic probe window and then scanning the layer with a laser for 1 Ba atom/ion or 0 Ba atom/ion. We can now image single Ba atoms in a solid xenon layer and have made progress toward single Ba⁺ ion images. We have discovered much about the physics/chemistry of Ba atoms and Ba⁺ ions in solid xenon and the deposition of thin and thick solid xenon layers, but there is much still to learn in order to perfect the imaging method. I will present these results and our parallel work to date towards grabbing and detecting Ba⁺ ions from a liquid xenon cell.

Primary author: FAIRBANK, Bill (Colorado State University)

Presenter: FAIRBANK, Bill (Colorado State University)

Session Classification: Ba daughter tagging