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Progress on a cryoprobe spectroscopy system for barium tagging in nEXO¹ ALEC IVERSON, ADAM CRAYCRAFT, TREY WAGER, DAVID FAIRBANK, WILLIAM FAIRBANK, Colorado State University, NEXO COLLABORATION — The nEXO experiment is a planned search for $0\nu\beta\beta$ decay using a liquid xenon time projection chamber. In order to reduce background, several methods for identifying (or “tagging”) the daughter barium are being developed. One potential method of barium tagging being investigated involves freezing the potential barium in solid xenon and then extracting the frozen sample by using a cryoprobe system. Matrix isolation spectroscopic techniques would then be used to identify the single barium within the frozen sample. Progress is presented here on developing a cryoprobe spectroscopy system at CSU for freezing solid xenon (SXe) from liquid xenon, creation of Ba^+ ions by laser ablation of Ba metal and capturing them in SXe on a window on the cryoprobe and spectroscopy of the Ba atoms and ions in the SXe.

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