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A Temperature-driven Liquid Xenon Recirculation and Purification System JULIO CESAR BENITEZ-MEDINA, KENDY HALL, Colorado State University — We have built a liquid xenon recirculation and purification system in order to address the problem of inconsistencies in our Ba^+ fluorescence spectra. In our previous work our liquid xenon purity system did not include recirculation, and the liquid xenon contained ppm of electronegative impurities. By continuous recirculation through a getter purifier, ppb purity is expected. Our recirculation system is driven thermally, by applying heat to the evaporation region, instead of by the pump method used by others. The advantage of thermal driven recirculation is that there are no pressure surges. Therefore, the liquid is calm as it evaporates and condenses. This gives excellent optical quality for Ba^+ spectroscopy in liquid xenon. The goal of this work is to detect fluorescence from single Ba^+ daughter ions in the Enriched Xenon Observatory (EXO) double beta decay experiment.

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