Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Isotope selective ion trap loading with pulsed laser ablation of BaCl targets[1] BRENDAN WHITE, PEI JIANG LOW, MATT DAY, USMAN KHAN, CRYSTAL SENKO, University of Waterloo — We present our efforts towards laser ablating Barium atoms from a salt compound and using photoionization to selectively load different ion isotopes. Commonly, ion trapping groups use a resistively heated oven as a source for atoms, a method which takes on the order of minutes and results in a high rate of contamination on trap electrodes. Pulsed laser ablation allows one to trap and turn off the loading mechanism instantaneously, allowing us to load a particular chain of ions much more quickly and displace less material. In addition, the heat load applied near the ion trap is much lower. We show that laser ablation can be applied to BaCl salt targets to produce and trap Barium ions. Further, we demonstrate that by controlling the frequency of the first photoionization laser, we can discriminate between the different isotopes of Barium; we can then selectively ionize a desired isotope for loading in our ion trap.

[1]This research was supported in part by the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Canada First Research Excellence Fund (CFREF).

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Date submitted: 31 Jan 2020 Electronic form version 1.4