

Abstract Submitted
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Direct Observation of the $6S_{1/2}$ to $5D_{3/2}$ Electric Quadrupole Transition in Barium-138¹ ADAM KLECZEWSKI, MATT HOFFMAN, ERIC MAGNUSON, BORIS BLINOV, NORVAL FORTSON, University of Washington — The $6S_{1/2}$ to $5D_{3/2}$ electric quadrupole transition at 2051 nm in Ba+ plays an important role in a number of proposed experiments.^{2,3,4} We present the results of the first narrow laser spectroscopy performed on this transition. 2051 nm light is generated by a diode pumped solid state Tm,Ho:YLF laser. The laser is frequency stabilized to a high finesse cavity made from ultra-low expansion glass. In order to take advantage of higher performing optics and detectors available at shorter wavelengths, the 2051 nm light is frequency doubled using a periodically poled lithium niobate crystal inside a bow-tie enhancement cavity before being sent to the reference cavity. Using this laser system we observed Rabi oscillations on the $6S_{1/2}$ to $5D_{3/2}$ transition and demonstrated a laser-ion coherence time of 3 ms.

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