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Session D1: Poster Session (16:30 - 18:00)

4:30 PM–4:30 PM, Friday, May 2, 2014
Alder Commons Room: 102/103 (Common Area)

Chair: Gina Passante, University of Washington

Abstract: D1.00011 : Progress toward a polarization rotation measurement of the $6S_{1/2} \leftrightarrow 5D_{3/2}$ magnetic dipole transition amplitude in Ba^{+}

Preview Abstract

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Authors:

Anupriya Jayakumar
(University of Washington)

Spencer R. Willams
(University of Washington)

Matthew R. Hoffman
(University of washington)

Boris B. Blinov
(University of Washington)

Norval Fortson
(University of washington)

We report our progress on the measurement of the magnetic dipole transition moment (\textit{M1}) in Ba $^{+}$ for the $6S_{1/2}(m) \leftrightarrow 5D_{3/2}(m^{'})$ transition with a linearly polarized 2051 nm laser. The motivation behind this study is to make a precise measurement of \textit{M1}, which is the leading source of systematic error in our planned parity nonconservation measurement. To date there are only two theory calculations that have been reported for \textit{M1} in Ba^{+} which are $80 \times 10^{-5}\mu_B$ [1] and $20 \times 10^{-5}\mu_B$ [2]. In our technique, the Rabi frequency was measured for the $6S_{1/2} \leftrightarrow 5D_{3/2}$ transition with $\Delta m = 0$ and $\Delta m = 2$ as a function of the linear polarization angle of the 2051 nm beam. We used the $\Delta m = 2$ transition (that has no \textit{M1} contribution) as a check for systematics in the polarization of the beam. By measuring the polarization dependence of the $\Delta m = 0$ transition Rabi frequency we can extract the ratio of the \textit{M1} to the much larger and well known electric quadrupole amplitude, from which we can extract \textit{M1}.\\[4pt] [1] PRA \textbf{74}, 062504\\[0pt] [2], PRA \textbf{88}, 034501.