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Session D1: Poster Session (16:30 - 18:00)
4:30 PM, Friday, May 2, 2014
Alder Commons Room: 102/103 (Common Area)

Chair: Gina Passante, University of Washington

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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

Abstract

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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.