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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 $Ba^+$**

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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  $M1$  to the much larger and well known electric quadrupole amplitude, from which we can extract  $M1$ . [1] PRA **74**, 062504 [2], PRA **88**, 034501.

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