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Preliminary results measuring the strongly forbidden magnetic dipole transition moment for the $6S_{1/2} \leftrightarrow 5D_{3/2}$ transitions in Ba^{+1} SPENCER WILLIAMS, ANUPRIYA JAYAKUMAR, MATTHEW HOFFMAN, BORIS BLINOV, NORVAL FORTSON, University of Washington — We report the latest results from our effort to measure the magnetic dipole transition moment (M1) between the $6S_{1/2}$ and $5D_{3/2}$ manifolds in Ba^+. Knowledge of M1 is crucial for a parity-nonconservation experiment in the ion where M1 will be a leading source of systematic errors. To date no measurement of M1 has been made in Ba^+, however, two calculations were recently reported which found M1 to be $80\times10^{-5}{\mu_B}^2$ and $22\times10^{-5}{\mu_B}^3$. A precise measurement may help to resolve this theoretical discrepancy which originates from their different estimations of many-body effects. To access the transition moment we use a variation of a previously proposed technique[4] that allows us to observe the effect of M1 directly in the Rabi frequency of particular Zeeman transitions. In this preliminary experiment we eliminate the electric quadrupole coupling by varying the linear polarization angle of the resonant laser.

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