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Progress toward measuring the $6S_{1/2} \leftrightarrow 5D_{3/2}$ magnetic-dipole transition moment in Ba^{+1} SPENCER WILLIAMS, University of Washington, ANUPRIYA JAYAKUMAR, MATTHEW HOFFMAN, BORIS BLINOV, NORVAL FORTSON, University of Washingon — 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^+. We describe a new technique for calibrating view-port birefringence and how we will use it to enhance the M1 signal. To access the transition moment we use a variation of a previously proposed technique[2] that allows us to isolate the magnetic-dipole coupling from the much larger electric-quadrupole coupling in the transition rates between particular Zeeman sub-levels. Knowledge of M1 is crucial for a parity-nonconservation experiment in the ion where M1 will be a leading source of systematic errors. No measurement of this M1 has been made in Ba^+, however, there are three calculations that predict it to be $80\times10^{-5}\mu_B$,[3] $22\times10^{-5}\mu_B$,[4] and $17\times10^{-5}\mu_B$.[5] A precise measurement may help resolve this theoretical discrepancy which originates from their different estimations of many-body effects.

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[2]S.R. Williams, *et. al.* Phys. Rev. A 88, 012515 (2013).
[3]B.K. Sahoo, *et. al.* Phys. Rev. A 74, 062504 (2006).
[4]G.H. Gossel, *et. al.* Phys. Rev. A 88, 034501 (2013).
[5]M. Safronova, Private communication

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