

Abstract Submitted  
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**Excitation of the  $5p$ - $8p$  Electric Quadrupole Transition in Cold Rb Atoms** RICO PIRES, MARCO ASCOLI, EDWARD EYLER, PHILIP GOULD, University of Connecticut — We have observed the electric-dipole (E1) forbidden, but electric-quadrupole (E2) allowed,  $5p$ - $8p$  transition in a sample of ultracold  $^{87}\text{Rb}$  atoms. The  $5p_{3/2}$  level is populated by a diode laser at 780 nm, while the  $5p_{3/2}$  to  $8p_{1/2,3/2}$  transition is driven with a dye laser at 587 nm. We have performed the experiment both with cw dye laser excitation and with pulsed amplification ( $\sim 7$  ns) of this cw light. In both cases, the  $8p$  atoms are detected by pulsed photoionization. With cw excitation, we can easily resolve the  $5p$  and  $8p$  hyperfine structures. By comparing transitions from the  $5p_{3/2}$ ,  $F'=0$  level to  $8p_{1/2}$  levels with  $F''=1$  and 2, we can set a limit on the weak magnetic-dipole (M1) contribution to the transition strength.<sup>1</sup> This work is supported by NSF.

<sup>1</sup>S.B. Bayram, et al., Phys. Rev. A 62, 012503 (2000).

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