

Abstract Submitted
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Quadrupole Transitions to Rydberg States in an Ultracold ^{85}Rb Gas¹ D. TONG, S.M. FAROOQI, E.G.M VAN KEMPEN, E.E. EYLER, P.L. GOULD, University of Connecticut — We report the observation of dipole-forbidden, but quadrupole-allowed, transitions to Rydberg states in ^{85}Rb . Using pulsed UV excitation ($\lambda = 297$ nm) of ultracold atoms in a MOT, we are able to drive $5s \rightarrow nd$ quadrupole (E2) transitions. We show that these transitions are one-photon excitations and give evidence that they are not caused by stray-field induced Stark-mixing. These transitions are observed over the range $n=28$ to $n=50$. We will give the measured E1/E2 transition strength ratio at various principal quantum numbers n . We will also report our experimental measurements of the np fine-structure transition strength ratio for principal quantum number up to $n=70$.

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