

Abstract Submitted
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RYDBERG Excitation of Laser-cooled Potassium Atoms in the AC-MOT¹ JOHN AGOMUO, Nigerian Defence Academy, Kaduna, ANDREW MURRAY, MATTHEW HARVEY, The University of Manchester — The operation of a new cold atom trap (the AC-MOT) and its application in Rydberg atom spectroscopy experiments is described. A significant limitation of magneto optical trapping (MOT) techniques has been the requirement to eliminate the magnetic fields prior to the interaction occurring. The AC-MOT is a pulsed trap, so that the magnetic fields are eliminated prior to the excitation to Rydberg states. The excitation of potassium atom to different Rydberg states is discussed, the excitation proceeding in a stepwise manner using a combination of infrared radiation and radiation from a tunable blue laser. Precise energy levels of high- n Rydberg states of potassium have been measured using stepwise-excitation of cooled, trapped atoms in the AC-MOT, with the intermediate state being the $4^2P_{1/2}$ state.

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