

Abstract Submitted
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Atomic Beam Density Characterization by Diode Laser Absorption Spectroscopy PAUL OXLEY, JOSEPH WIHBEY, The College of the Holy Cross — Atomic beams are used in many atomic physics experiments, and one of the key parameters of the beam is its density. We present experimental and theoretical details of a technique to determine absolute line-integrated beam densities based on resonant laser absorption. In our experiment a thermal lithium beam is chopped and a lockin amplifier detects the laser absorption signal at the chop frequency. This method is sensitive enough to allow detection of beams with densities as low as 5×10^5 atoms/cc, for a 9mm beam thickness. We also explore the possibility of extending our method by using the related technique of wavelength modulation spectroscopy. This will reduce noise in the absorption signal, allow the beam density to be determined more rapidly, and will not require the atomic beam to be chopped. We anticipate improvements of up to a factor of 100 reduction in noise and up to a factor of 1000 increase in speed.

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