

Abstract Submitted  
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**Precision Measurement of the Rb D2 Transition Linewidth at Ultralow Temperature**<sup>1</sup> BRAD SCHULTZ, GEORGE NOBLE, HE MING, WILLIAM VAN WIJNGAARDEN, York University — The Rb D2 linewidth was studied using atoms cooled to a temperature of 50  $\mu$ K that were contained in a magneto-optical trap. The transmission of a probe laser through the atom cloud was monitored using a CCD detector. The probe laser frequency was scanned across the resonance using an acousto-optic modulator. The observed lineshape was very well fitted by a Lorentzian function. The full width half maximum linewidth was examined as a function of the optical depth and the probe laser intensity. The extrapolated value at zero optical depth was determined with an accuracy of 0.3%. This corresponds to a radiative lifetime of the  $5P_{3/2}$  state that is consistent with results determined by measuring the temporal decay of fluorescence or photoassociation spectroscopy. The experimental results are slightly less than that computed using relativistic many body perturbation theory.

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