Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Diffuse light scattering from a dense and cold microscopic ^{87}Rb sample[1] KASIE KEMP, S.J. ROOF, M.D. HAVEY, Old Dominion University, I.M. SOKOLOV, D.V. KUPRIYANOV, State Polytechnic University — We report investigation of near-resonance light scattering from a cold atomic sample of ^{87}Rb. Measurements are made on the $F = 2 \rightarrow F' = 3$ nearly closed hyperfine transition for atomic densities ranging from $\sim 10^{10}$ to $\sim 10^{13}$ atoms/cm^3. The sample, initially prepared in a magneto-optical trap, is loaded into a far-off-resonance trap (FORT) in which the ensemble has a temperature $\sim$100 μK and initial Gaussian radii of $\sim$3 μm and $\sim$280 μm in the transverse and longitudinal directions, respectively. The experimental geometry consists of projecting a near-resonance collimated laser beam onto the entire volume of the FORT and detecting the diffusely scattered light. The measured scattered light intensity as a function of detuning, atomic density, and sample size suggests that collective light scattering plays an important role in the experimental results.

[1]This research is supported by the National Science Foundation (Grant No. NSF-PHY-1068159).

Kasie Kemp
Old Dominion University

Date submitted: 29 Jan 2015 Electronic form version 1.4