

Abstract Submitted
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Time-dependent electromagnetic wave dynamics in ultracold, high-density Rb vapor¹ S. BALIK, J. MILLS, C.I. SUKENIK, M.D. HAVEY, Old Dominion University, I.M. SOKOLOV, D.V. KUPRIYANOV, St. Petersburg State Polytechnic University — Recent experiments and theoretical results on Anderson localization of light in condensed samples show that diffusive transport is strongly suppressed and that a regime of anomalous diffusion develops dynamically. Proximity of the light localization threshold can be detected through time evolution of either forward or diffusely scattered light. We report in this paper recent measurements on time-dependent light scattering in the spectral vicinity of the $F = 1 \rightarrow F' = 0$ optical transition in dense, ultracold atomic ^{87}Rb samples formed in an optical dipole trap. For the $\sim 10^{14}$ *atoms/cm*³ density of these samples, the Ioffe-Regel criterion $kl \sim 0.8$, indicating that localization effects should be evident. Theoretical results on spectral variations of the total scattering cross section in the strong localization regime are also presented.

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