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Anderson localization and anomalous Slow Absorption of Stationary Light by Disorder RAZMIK UNANYAN, NIKOLAI LAUK, MICHAEL FLEISCHHAUER, Department of Physics and Research Center OPTIMAS, University of Kaiserslautern — We investigate the long time behavior of stationary light generated in a electromagnetically induced transparency (EIT) medium in the presence of randomly distributed absorbing impurities. By assuming a Poisson distribution for impurity atoms in the EIT medium we show that the absorption process can be much slower than naively expected. We show that this anomalous absorption of light is a consequence of the analogue of Anderson localization in the diffusion regime. A simple expression for the absorption for long times is derived in the case of perfect absorbing atoms. We show that it is described by $\exp(-\alpha t^{1/3})$, where α is a constant depending on the concentration of impurities and thus is much slower than expected exponential decay.

Michael Fleischhauer
Department of Physics and Research Center OPTIMAS,
University of Kaiserslautern

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