ON THE HOMOGENIZATION OF THE HEAT EQUATION WITH RANDOM COEFFICIENTS

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We consider the heat equation with random coefficients on $\mathbb{Z}^d$. The randomness of the coefficients models the inhomogeneous nature of the medium where heat propagates. We assume that the distribution of these coefficients is invariant under spatial translations, and has a finite range of dependence. It is known that if a solution to this equation is rescaled diffusively, then it converges to the solution of a heat equation with constant coefficients. In probabilistic terms, this convergence corresponds to the fact that the associated random walk satisfies a central limit theorem. I will present recent progress on the estimation of the speed of this convergence, based on the random walk representation.