

On a regularity estimate for random elliptic operators

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May 26, 2016

In the talk I will give an introduction to my ongoing research based on a recent work of A. Gloria, S. Neukamm, and F. Otto on stochastic homogenization. Consider the random differential operator $-\nabla \cdot a \nabla$ where the random matrix (coefficient field) a is assumed to be stationary, ergodic and uniform elliptic. The main part of the talk will explain the idea of *perturbing around the homogenized coefficient field*. By making use of the extended correctors (ϕ, σ) and choosing a reasonable homogenization error, one can obtain a regularity estimate, namely the excess decay, which implies a Liouville principle for a -harmonic functions. It is interesting to know whether this idea can be applied for the discrete case: The last part of the talk will discuss some ideas and open problems.