Stochastic Homogenization of PDE on non-uniformly Lipschitz and percolating structures

Martin Heida[1,*], ,

[1] *Weierstrass Institute for Applied Analysis and Stochastics, 10117 Berlin, Germany*
[*] Email: martin.heida@wias-berlin.de

One of the major challenges in stochastic homogenization is the interplay of partial differential equations and geometry. This particularly applies to the setting when the geometry locally exhibits arbitrary large Lipschitz constants or separates into several (i.e. more than one) percolation clusters. The best result so far is [1] and applies to uniformly Lipschitz and non-percolating geometries.

We provide a new approach to handle homogenization on a class of non-uniformly Lipschitz and percolating structures and apply it to convex functionals on perforated domains with percolating holes. Particular geometric examples we will consider are ball processes, such as the poisson ball process, and some stochastically disturbed periodic geometries.

References

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