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Mathematics > Analysis of PDEs

Stochastic sigma-convergence and applications

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Motivated by the fact that in nature almost all phenomena behave randomly in some scales and deterministically in some other scales, we build up a framework suitable to tackle both deterministic and stochastic homogenization problems simultaneously, and also separately. Our approach, the stochastic sigma-convergence, can be seen either as a multiscale stochastic approach since deterministic homogenization theory can be seen as a special case of stochastic homogenization theory (see Theorem 3), or as a conjunction of the stochastic and deterministic approaches, both taken globally, but also each separately. One of the main applications of our results is the homogenization of a model of rotating fluids.

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