	doc_1		doc_2		decision	id
cases	**authors**	• Heida, M. • Neukamm, S. • Varga, M.	**authors**	• Heida, Martin • Neukamm, Stefan • Varga, Mario	DUPLICATES	1094
	title	Stochastic unfolding and homogenization	**title**	Stochastic unfolding and homogenization		
	publication_date	2017-12-01 00:00:00	**publication_date**	2017-01-01 00:00:00		
	source	SupportedSources.CORE	**source**	SupportedSources.CORE		
	journal		**journal**			
	volume		**volume**			
	doi	None	**doi**	10.20347/wias.preprint.2460		
	urls	• https://core.ac.uk/download/267951867.pdf	**urls**	• https://core.ac.uk/download/289299292.pdf		
	id	id-1263098081160519335	**id**	id1229208670939777266		
	abstract	The notion of periodic two-scale convergence and the method of periodic un- folding are prominent and useful tools in multiscale modeling and analysis of PDEs with rapidly oscillating periodic coe cients. In this paper we are interested in the theory of stochastic homogenization for continuum mechanical models in form of PDEs with random coe cients, describing random heterogeneous materials. The notion of periodic two-scale convergence has been extended in di erent ways to the stochastic case. In this work we introduce a stochastic unfolding method that fea- tures many similarities to periodic unfolding. In particular it allows to characterize the notion of stochastic two-scale convergence in the mean by mere convergence in an extended space. We illustrate the method on the (classical) example of stochastic homogenization of convex integral functionals, and prove a stochastic homogeniza- tion result for an non-convex evolution equation of Allen-Cahn type. Moreover, we discuss the relation of stochastic unfolding to previously introduced notions of (quenched and mean) stochastic two-scale convergence. The method descibed in the present paper extends to the continuum setting the notion of discrete stochastic unfolding, as recently introduced by the second and third author in the context of discrete-to-continuum transition	**abstract**	The notion of periodic two-scale convergence and the method of periodic unfolding are prominent and useful tools in multiscale modeling and analysis of PDEs with rapidly oscillating periodic coefficients. In this paper we are interested in the theory of stochastic homogenization for continuum mechanical models in form of PDEs with random coefficients, describing random heterogeneous materials. The notion of periodic two-scale convergence has been extended in different ways to the stochastic case. In this work we introduce a stochastic unfolding method that features many similarities to periodic unfolding. In particular it allows to characterize the notion of stochastic two-scale convergence in the mean by mere convergence in an extended space. We illustrate the method on the (classical) example of stochastic homogenization of convex integral functionals, and prove a stochastic homogenization result for an non-convex evolution equation of Allen-Cahn type. Moreover, we discuss the relation of stochastic unfolding to previously introduced notions of (quenched and mean) stochastic two-scale convergence. The method introduced in this paper extends extitdiscrete stochastic unfolding, as recently introduced by the second and third author in the context of discrete-to-continuum transition		
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