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Stochastic homogenization: An estimate for the two-scale expansion for correlated coefficients

We study linear elliptic systems with rapidly oscillating, random (stationary and ergodic) coefficients. We consider the classical two-scale expansion for such systems and establish an H^1-error estimate. While estimates on the error of the two-scale expansion are well understood in the case of (deterministic) periodic homogenization, the situation for random coefficients is more subtle and it turns out that the error is highly sensitive to the mixing properties and the strength of correlations of the random coefficients. The talk is based on a joint work with Antoine Gloria and Felix Otto.