Minisymposium 8 - Homogenisierung und Anwendungen

Exponential homogenisation of periodic linear problems

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The homogenisation of a divergence type second order uniformly elliptic operator is considered with arbitrary L^∞ rapidly oscillating periodic coefficients, either with periodic boundary conditions or in the whole space. We show that if the right-hand side is analytic then by optimally truncating the full two-scale asymptotic expansion for the solution one obtains an approximation with an exponentially small error in the period of the rapid oscillation. The optimality of the exponential error bound is established for a one-dimensional example by giving the analogous lower bound.