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Homogenization of Evolution Problems in a Fiber Reinforced Structure

We study the homogenization of parabolic or hyperbolic equations like

$$\rho_\epsilon(x) \frac{\partial^n u_\epsilon}{\partial t^n} - \operatorname{div}(a_\epsilon(x) \nabla u_\epsilon) = f$$

on $\Omega \times (0, T)$ plus *boundary conditions*, $n \in \{1, 2\}$, where the coefficients a_ϵ and ρ_ϵ takes values of very different order on an ϵ -periodic subset $T_\epsilon \subset \Omega$ (fibered structure) and elsewhere. We find a non local effective equation deduced from a homogenized system of several equations.

Keywords: homogenization, fiber structures, two-scale convergence, Γ -convergence.

MSC 2000: 35B40, 35J55, 74B05, 74K10, 74Q15.