

# Asymptotic Analysis of the Approximate Control for Parabolic Equations with Periodic Interface

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We present here some results concerning the asymptotic behavior of the approximate control for some parabolic equations with periodic rapidly oscillating coefficients in a two-component composite with a periodic interfacial resistance.

We first show the approximate controllability of the problem, as well as that of the homogenized one, which is more difficult to study since, as proved in [4], it is a coupled system P.D.E.-O.D.E. Following an idea introduced by J.-L. Lions in [5], for each problem the approximate control is constructed as the solution of related transposed problem having as final data the (unique) minimum point of a suitable functional. In the second part of the talk, we show that the control and the corresponding solution of the periodic problem converge respectively to the control and to the solution of the homogenized problem. The corrector results given in [1] play an important role in the proofs.

The approximate controllability behaviour of a linear parabolic equations with rapidly oscillating coefficients was studied by E. Zuazua in [6] for a fixed domain with Dirichlet conditions, and in [3] for periodically perforated domains with Neumann conditions.

One of the main difficulties here is the construction of the appropriate functionals in order to obtain non only the approximate controllability, but also the convergence results. The talk is based on the joint work with Editha C. Jose (UP-Los Baños) appeared in [2].

## References:

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