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Asymptotic study and convergence of a nonlinear optimal boundary control problem governed by an elliptic boundary problem on a nanostructure

Communication Info

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Abstract

We consider a boundary optimal control problem associated with a nonlinear elliptic boundary problem with a p-Laplacian operator and posed in a three dimensional domain composed on an oscillating nano-layer of thickness depending of a small parameter ε in which the control is applied on the oscillating boundary Σ_ε . The cost functional is assumed to be dependent on the gradient of the state and on the norm of the control. First, we study the existence of the solution and we use the epi-convergence method in order to establish the limit behavior of the problem. Secondly, we study the convergence of the boundary optimal control and identify the limit of optimality elements as the solution of a limit optimal control problem containing a boundary control and associated to a limit cost functional.

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