

OPTIMAL DESIGN THROUGH THE HOMOGENIZATION THEORY

FAUSTINO MAESTRE CABALLERO AND JUAN CASADO DÍAZ*

We consider a control problem for an elliptic PDE, where the control variables are given by the coefficients of the equation, and the open set where the equation is posed. This type of problems arises in the optimal design of materials and shapes. It is well known the lack of solution, which makes necessary to introduce a relaxed formulation. Here, we show how this can be done using the homogenization theory. Moreover, from the numerical point of view, this relaxed formulation has better properties than the original one. In this sense, we will present a gradient descent algorithm and we apply it to solve some examples.

*Departamento de Ecuaciones Diferenciales y Análisis Numérico, Universidad de Sevilla