

Optimal location of Dirichlet regions for elliptic PDEs

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Abstract

We consider an elliptic problem in a given domain Ω and a given right hand side f . The Dirichlet region is the unknown of the problem and has to be chosen in an optimal way, in order to minimize a cost functional, and in a class of admissible choices. The cost we consider is the compliance functional and the class of admissible choices consists either of all sets of N points or of one-dimensional connected sets (networks) of a given length L . Then we let N (respectively L) tend to infinity and look for the asymptotical distribution of the Dirichlet regions. The asymptotically optimal shapes are discussed as well and links with average distance problems are provided.