

*Determining the Best Domain for
Nonlinear Diffusion Equations by
Shape-Measure Method*

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Abstract

The aim is to find the optimal domain for a nonlinear diffusion control system in cartesian coordinates. The domain's boundary is consisted of a fixed and a variable parts. First, by regarding the advantages of the embedding method, the system is solved for any given domain as an optimal control problem. Then, after approximating the variable part of each domain by a finite number of segments, the optimal domain and its relative nearly optimal control, is illustrated. For this reason some optimization techniques is applied. Also the method can satisfy the other wished conditions like the area limitations; some numerical examples are given.

Keywords: optimal domain, diffusion equation, Radon measure, optimization, control, shape.