

Optimal thin torsion rods

Abstract: We consider a 2d-infimum problem in which the cost functional is an integral depending on the gradient through a convex but not strictly convex integrand, and the admissible functions satisfy both an integral constraint and a Dirichlet boundary condition.

We focus attention in particular on the question whether solutions exist whose gradient "avoids" the region of non-strict convexity.

The link of such problem with the possible occurrence of homogenization phenomena in the optimal design of thin torsion rods will be discussed, as well as its relationship with the Cheeger problem set on the rod's cross section.