Optimal design problems
ruled by fractional diffusions

Abstract

We discuss optimization problems ruled by fractional diffusion operators with volume constraints. By means of penalization techniques we prove existence of solutions. We also show that every solution is locally of class $C^{0,\alpha}$ (optimal regularity), and that the free boundary is a $C^{1,\gamma}$ surface, up to a $\mathcal{H}^{n-1}$-negligible set.