Abstract

We prove the existence of a minimizer for a large class of functionals defined over all convex domains of given volume included in a bounded subspace D of $\mathbb{R}^N$. Some applications are given, in particular we shall see that the eigenvalues of a class of second and fourth order operators with non-constant coefficients can be minimized over this class of domains, as well as integral functionals depending on the solution of an elliptic equation. Moreover, the third application of this result is related to the famous Newton's problem of minimal resistance. In general, all the results we shall develop are valid for elliptic operators of any order $2p, p \geq 1$.

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