



# Weighted isoperimetric inequalities in cones and applications

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This paper deals with weighted isoperimetric inequalities relative to cones of  $\mathbb{R}^N$ . We study the structure of measures that admit as isoperimetric sets the intersection of a cone with balls centered at the vertex of the cone. For instance, in case that the cone is the half-space  $\mathbb{R}_+^N = \{x \in \mathbb{R}^N : x_N > 0\}$  and the measure is factorized, we prove that this phenomenon occurs if and only if the measure has the form  $d\mu = a x_N^k \exp(c|x|^2) dx$ , for some  $a > 0$ ,  $k, c \geq 0$ . Our results are then used to obtain isoperimetric estimates for Neumann eigenvalues of a weighted Laplace-Beltrami operator on the sphere, sharp Hardy-type inequalities for functions defined in a quarter space and, finally, via symmetrization arguments, a comparison result for a class of degenerate PDE's.

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