

# Some isoperimetric inequalities with respect to monomial weights

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**Abstract.** In this talk a class of isoperimetric problems on  $\mathbb{R}_+^2$  with respect to monomial weights is presented. Let  $\alpha$  and  $\beta$  be real numbers that satisfy certain conditions. We show that, among all smooth sets  $\Omega$  in  $\mathbb{R}_+^2$  with fixed weighted measure  $\iint_{\Omega} y^{\beta} dx dy$ , the weighted perimeter  $\int_{\partial\Omega} y^{\alpha} ds$  achieves its minimum for a smooth set which is symmetric w.r.t. to the  $y$ -axis, and is explicitly given. Our results also imply an estimate of a weighted Cheeger constant and a sharp bound for eigenvalues of some nonlinear problems.

The results are joint work with A. Alvino, F. Brock, F. Chiacchio, A. Mercaldo and M.R. Posteraro.