Symmetrization and second order Sobolev inequalities

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We present a Polya-Szego type principle involving the second order derivatives of compactly supported functions in n-dimensional euclidean space. As a consequence, a new unified approach to second order Sobolev inequalities via 1-dimensional Hardy type inequalities is derived. We also exhibit some applications to optimal Sobolev embeddings.

Nonlinear problems having natural growth in the gradient

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We consider problems concerning a class of nonlinear equations which are characterized by the fact that they contain both a principal term in the form of a Leray-Lions operator defined on $W_0^{1,p}$ and a term which grows as the p-th power ($p > 1$) of the gradient of the unknown function. Various existence and regularity questions are addressed. In particular, we focus our attention on some "limit" cases.