Nonlinear elliptic critical problems in $\mathbb{R}^N$

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Abstract

In this talk we discuss some recent results concerning elliptic problems of (p, q)-Laplacian type in all of $\mathbb{R}^N$ with a nonlinearity involving both a critical term and a subcritical term, nonnegative nontrivial weights and a positive real parameter λ. In particular, under suitable conditions on the exponents of the nonlinearity, we obtain existence and multiplicity results with negative and positive energy depending on the range of the parameter λ, overcaming the double loss of compactness due both to the critical Sobolev's exponent p^* and to the unboundedness of the domain. We analyze also the case of nonnegative nontrivial weights satisfying some symmetry conditions with respect to a certain group $T \subset O(N)$, where $O(N)$ is the group of orthogonal linear transformations in $\mathbb{R}^N$. Our proofs use variational methods and the concentration-compactness principle.