POSITIVE GROUND STATES FOR A CLASS OF (p,q)-LAPLACIAN COUPLED SYSTEMS IN $\mathbb{R}^N$

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In this talk we study the existence of positive solutions for the following class of (p,q)-Laplacian coupled systems

$$\begin{cases} -\Delta_p u + a(x)|u|^{p-2}u = f(u) + \alpha\lambda(x)|u|^{\alpha-2}u|v|^{\beta}, & x \in \mathbb{R}^N, \\ -\Delta_q v + b(x)|v|^{q-2}v = g(v) + \beta\lambda(x)|v|^{\beta-2}v|u|^{\alpha}, & x \in \mathbb{R}^N, \end{cases}$$

where $N \geq 3$ and $1 \leq p \leq q < N$. Here the coefficient $\lambda(x)$ of the coupling term is related with the potentials by the condition $|\lambda(x)| \leq \delta a(x)^{\alpha/p} b(x)^{\beta/q}$ where $\delta \in (0,1)$ and $\alpha/p + \beta/q = 1$. The nonlinear terms $f(s)$, $g(s)$ are "superlinear" at 0 and at ∞ and are assumed without the well known Ambrosetti-Rabinowitz condition at infinity. Thus, we have established the existence of positive ground states solutions for a large class of nonlinear terms and potentials. Our approach is variational and based on minimization technique over the Nehari manifold.

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