NONLINEAR ELLIPTIC SYSTEMS INVOLVING 

\((p(x), q(x))\)–LAPLACIAN

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Abstract: In this talk, by using the mountain pass theorem, we obtain the existence of non trivial weak solutions of the following nonlocal elliptic system

\[
- M_1 \left( \int_{\Omega} \frac{1}{p(x)} |\Delta u|^{p(x)} \, dx \right) \Delta (|\Delta u|^{p(x)-2} \Delta u) = F_u(x, u, v) \quad \text{in } \mathbb{R}^N,
\]

\[
- M_2 \left( \int_{\Omega} \frac{1}{q(x)} |\Delta v|^{q(x)} \, dx \right) \Delta (|\Delta v|^{q(x)-2} \Delta v) = F_v(x, u, v) \quad \text{in } \mathbb{R}^N,
\]

(1)

\(p\) and \(q\) are real valued functions satisfying \(1 < p(x), q(x) < N\) \((N \geq 2)\) for every \(x \in \mathbb{R}^N\), and \(M_1\) and \(M_2\) are continuous and bounded functions. The real valued function \(F \in C^1(\mathbb{R}^N \times \mathbb{R}^2)\) satisfies some assumptions. The unknown real valued functions \(u\) and \(v\) stay in appropriate spaces. The operator \(\Delta_{p(x)}u = \text{div} \left(|\nabla u|^{p(x)-2} \nabla u\right)\) designates the \(p(x)\)-Laplacian.

Références


