

A priori bound and multiplicity of solutions for an indefinite elliptic problem with critical growth in the gradient

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Abstract

In this talk we deal with the boundary value problem

$$-\Delta u = \lambda c(x)u + \mu(x)|\nabla u|^2 + h(x), \quad u \in H_0^1(\Omega) \cap L^\infty(\Omega),$$

where $\Omega \subset \mathbb{R}^N$, $N \geq 3$, is a bounded domain with smooth boundary and we assume $c, h^+ \in L^q(\Omega)$ for some $q > N/2$, $\mu, h^- \in L^\infty(\Omega)$ and $c^+ \not\equiv 0$. Under suitable assumptions on the coefficients, which may change sign, we prove an uniform a priori bound when $\lambda > 0$ is bounded away from zero. As a consequence of this a priori bound and assuming that (P_0) has a solution, we prove the existence of at least two solution for $\lambda > 0$ small enough.

This talk is based on a joint work with Colette De Coster (Université de Valenciennes et du Hainaut-Cambrésis).