Some multiplicity results of p–Laplacian type problems

Anna Maria Candela *

Let us consider the p–Laplacian type equation related to the functional

$$J(u) \; = \; \int_\Omega A(x,u)|\nabla u|^p dx - \int_\Omega G(x,u)dx,$$

where Ω is an open bounded domain in $\mathbb{R}^N$ and $p > 1$.

Suitable assumptions on A and G in $\Omega \times \mathbb{R}$, imply that J is a C^1 functional in $X = W_0^{1,p}(\Omega) \cap L^\infty(\Omega)$ equipped with $\|u\|_X = \|u\|_{W_0^{1,p}} + |u|_\infty$, but, in general, we have no hope to prove the Palais–Smale condition in the same Banach space.

Anyway, a suitable change of norm allows us to prove the existence of multiple critical points of J in X extending classical theorems to this setting.

All the results are in joint works with Giuliana Palmieri.

---
*Università di Bari "Aldo Moro", email: candela@dm.uniba.it