



DEPARTAMENTO DE
ANÁLISIS MATEMÁTICO Y
MATEMÁTICA APLICADA



SEMINARIO DE MATEMÁTICA APLICADA

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Ground states of elliptic equations with competition between power and gradient terms

Abstract:

Here we consider the nonnegative solutions of equations in a punctured ball $B(0, R) \setminus \{0\} \subset \mathbb{R}^N$ or in \mathbb{R}^N , of type

$$-\Delta u = u^p + M|\nabla u|^q \quad (1)$$

where $p, q > 1$ and $M \in \mathbb{R}$. We give new a priori estimates on the solutions and their gradient, and Liouville type results. We use Bernstein technique and Osserman's or Gidas-Spruck's type methods. The most interesting case is $q = 2p/(p+1)$, where the equation is invariant by scaling. In the radial case, we give a precise description of all the regular and singular solutions, improving the known results. The situation appears to be quite intricate in the case $M < 0$ of strong competition between the nonlinear terms.

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