

Ground states for a class of critical quasilinear coupled superlinear elliptic systems

Maxwell Lizete da Silva (maxwelllizete@hotmail.com)
Universidade Federal de Goiás

Abstract. We consider the following class of quasilinear coupled systems

$$\left\{ \begin{array}{l} -\Delta u + a(x)u - \Delta(u^2)u = g(u) + \theta\alpha\lambda(x)|u|^{\alpha-2}u|v|^\beta, \quad x \in \mathbb{R}^N, \\ -\Delta v + b(x)v - \Delta(v^2)v = h(v) + \theta\beta\lambda(x)|v|^{\beta-2}v|u|^\alpha, \quad x \in \mathbb{R}^N, \end{array} \right\}.$$

where $N \geq 3$ and $a, b : \mathbb{R}^N \rightarrow \mathbb{R}$ are positive potentials, $\lambda : \mathbb{R}^N \rightarrow \mathbb{R}$ is a nonnegative continuous function, $\theta > 0$ and $\alpha, \beta > 2$ satisfying $\alpha + \beta < 2 \cdot 2^*$. On the nonlinear terms we assume that g, h are in C^1 class which are superlinear functions at infinity and at the origin. We deal with nonlinearities g and h being subcritical or critical. The coupling term is a subcritical function which is superlinear at infinity. Our main theorem is stated without the well known Ambrosetti-Rabinowitz condition at infinity. Using a change of variable, we turn the quasilinear coupled system into a nonlinear coupled system, where we establish a variational approach based on Nehari method.