

Nonlinear elliptic singular systems with quadratic gradient lower order terms

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We present some results obtained in [2] on the existence of solution for quasilinear elliptic systems with lower order terms having quadratic growth in the gradient and singularities. The model problem is the following:

$$\begin{cases} -\Delta u + g_1(v) \frac{|\nabla u|^2}{u^\alpha} = f_1(x, u, v) & \text{in } \Omega, \\ -\Delta v + g_2(u) \frac{|\nabla v|^2}{v^\beta} = f_2(x, u, v) & \text{in } \Omega, \\ u, v \in H_0^1(\Omega), \end{cases} \quad (1)$$

where $\Omega \subset \mathbb{R}^N$ is a smooth bounded domain, $0 < \alpha, \beta < 1$ and f_1, f_2, g_1, g_2 are regular functions. A recent comparison principle for the scalar equation in [1] allow us to prove a sub-supersolution method and to deal with classical Lotka-Volterra models.

References

- [1] D. ARCOYA, J. CARMONA AND P. J. MARTÍNEZ-APARICIO, Comparison principle for elliptic equations in divergence with singular lower order terms having natural growth. *Commun. Contemp. Math.* DOI: 10.1142/S0219199716500139.
- [2] J. CARMONA, P. J. MARTÍNEZ-APARICIO AND A. SUÁREZ, A sub-supersolution method for Nonlinear elliptic singular systems with natural growth and some applications. *Nonlinear Analysis* **132** (2016), 47-65.

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