



EXISTENCE OF THREE NONTRIVIAL SOLUTIONS
FOR A CLASS OF SUPERLINEAR DEGENERATE
ELLIPTIC SYSTEMS

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Abstract

We study the degenerate semilinear elliptic systems of the form

$$\begin{cases} -\operatorname{div}(h(x)\nabla u) = \lambda(a(x)u + b(x)v) + F_u(x, u, v), & x \in \Omega, \\ -\operatorname{div}(h(x)\nabla v) = \lambda(d(x)v + b(x)u) + F_v(x, u, v), & x \in \Omega, \\ u|_{\partial\Omega} = v|_{\partial\Omega} = 0, \end{cases}$$

where $\Omega \subset \mathbb{R}^N (N \geq 2)$ is an open bounded domain with smooth boundary $\partial\Omega$, the measurable, nonnegative diffusion coefficient h is allowed to vanish in Ω (as well as at the boundary $\partial\Omega$) and/or to blow up in $\overline{\Omega}$. The existence of three nontrivial solutions for the superlinear degenerate elliptic systems is obtained by using variational theorems of mixed type due to Marino and Saccon and Linking Theorem.

Keywords and phrases: degenerate elliptic systems, superlinear, ∇ -condition, linking theorem, multiplicity of solutions.

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