Multiple positive solutions for classes of elliptic systems with combined nonlinear effects.

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Abstract

We study the existence of multiple positive solutions to systems of the form

$$\begin{cases} -\Delta u = \lambda f(v), & \text{in } \Omega, \\ -\Delta v = \lambda g(u), & \text{in } \Omega, \\ u = 0 = v, & \text{on } \partial\Omega. \end{cases}$$

Here Δ is the Laplacian operator, λ is a positive parameter, Ω is a bounded domain in $\mathbb{R}^N$ with smooth boundary and f, g belongs to a class of positive functions that have a combined sublinear effect at ∞. Our results also easily extend to the corresponding p-Laplacian systems. We prove our results by the method of sub and super solutions.