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Maya Chhetri* (maya@uncg.edu), Department of Mathematics and Statistics, 125 Petty Science Bldg, UNC Greensboro, Greensboro, NC 27402, and **Petr Girg**. *Existence and Nonexistence of Positive Solutions For a Class of Superlinear Semipositone Systems.*

We consider an elliptic system of the form

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

where $\lambda > 0$ is a parameter, Ω is a bounded domain in R^N with smooth boundary $\partial\Omega$. The nonlinearities $f, g : [0, \infty) \rightarrow R$ are C^1 functions that are superlinear at infinity and satisfy $f(0) < 0$ and $g(0) < 0$. We prove that the system has a positive solution for λ small when Ω is convex with C^3 boundary and no positive solution for λ large when Ω is a general bounded domain with $C^{2,\beta}$ boundary.

We use fixed point index combined with re-scaling argument to prove the existence result while positive solutions are analyzed in a sub-domain near the boundary to prove the nonexistence result. (Received September 01, 2008)