1044-35-18 **Jaffar Ali Shahul Hameed*** (js415@ra.msstate.edu), Fort Myers, FL 33965, and **Ken Brown** and **Ratnasingham Shivaji**. *Positive Solutions for $n \times n$ Elliptic Systems with Combined Nonlinear Effects.*

We study the existence and multiplicity of positive solutions to $n \times n$ systems of the form

$$\begin{aligned} -\Delta u_1 &= \lambda f_1(u_2) && \text{in } \Omega \\ -\Delta u_2 &= \lambda f_2(u_3) && \text{in } \Omega \\ \vdots \quad &= \quad \vdots \\ -\Delta u_{n-1} &= \lambda f_{n-1}(u_n) && \text{in } \Omega \\ -\Delta u_n &= \lambda f_n(u_1) && \text{in } \Omega \\ u_1 = u_2 = ... = u_n &= 0 && \text{on } \partial\Omega. \end{aligned}$$

Here Δ is the Laplacian operator, λ is a non-negative parameter, Ω is a bounded domain in R^n with smooth boundary $\partial\Omega$ and $f_i \in C^1([0,\infty))$, $i \in \{1, 2, \ldots, n\}$ belongs to a class of strictly increasing functions that have a combined sublinear effect at ∞. We establish results for positone systems ($f_i(0) \geq 0, i \in \{1, \ldots, l-1, l+1, \ldots, n\}$ and $f_l(0) > 0$ for some $l \in \{1, \ldots, n\}$), semipositone systems (no sign conditions on $f_i(0)$) and for systems with $f_i(0) = 0, i \in \{1, 2, \ldots, n\}$. We establish our results by the method of sub and super solutions.

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