1067-35-162   **Eunkyoung Lee**, **Lakshmi Sankar*** (`lk154@msstate.edu`) and **Ratnasingham Shivaji**.
Positive Solutions for Infinite Semipositone Problems on Exterior Domains.

We study positive radial solutions to the problem

$$
\begin{cases}
-\Delta u = \lambda K(|x|)f(u), & x \in \Omega \\
\quad u = 0, & \text{if } |x| = r_0 \\
\quad u \to 0 & \text{as } |x| \to \infty
\end{cases}
\tag{1}
$$

where λ is a positive parameter, $\Delta u = \operatorname{div}(\nabla u)$ is the Laplacian of u, $\Omega = \{x \in \mathbb{R}^n, n > 2 | |x| > r_0\}$ is an exterior domain and $f : (0, \infty) \to \mathbb{R}$ belongs to a class of sublinear functions at ∞ such that they are continuous and $f(0^+) = \lim_{s \to 0^+} f(s) < 0$. In particular we also study infinite semipositone problems where $\lim_{s \to 0^+} f(s) = -\infty$. Here $K : [r_0, \infty) \to (0, \infty)$ belongs to a class of continuous functions such that $\lim_{r \to \infty} K(r) = 0$. We establish various existence results for such boundary value problems and also extend our results to classes of systems. We prove our results by the method of sub-super solutions. (Received July 28, 2010)