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Eunkyung Ko* (ek94@msstate.edu), 319 N.Jackson st. 1A, Starkville, MS 39759. *Uniqueness and multiplicity results for classes of infinite positive problems.*

We study positive solutions to the singular boundary value problem

$$\begin{aligned} -\Delta u &= \lambda \frac{f(u)}{u^\beta} && \text{in } \Omega, \\ u &= 0 && \text{on } \partial\Omega, \end{aligned}$$

where λ is a positive parameter, $\beta \in (0, 1)$ and Ω is a bounded domain in \mathbb{R}^N , $N \geq 1$. Here $f \in C([0, \infty), (0, \infty))$ is nondecreasing and satisfies $\lim_{u \rightarrow \infty} \frac{f(u)}{u^{\beta+1}} = 0$. We discuss the existence of multiple positive solutions for a certain range of λ and a uniqueness result for $\lambda \gg 1$. A simple model that will satisfy our hypotheses is $f(u) = e^{\frac{\alpha u}{\alpha+u}}$ for $\alpha \gg 1$. We extend our multiplicity result to classes of systems, including p -Laplacian systems, when the nonlinearities satisfy certain combined sublinear conditions at infinity. We also extend our results to the case when Ω is an exterior domain. (Received August 19, 2011)