962-34-876          **Patrick S. Caldwell\*** (`psc1@ra.msstate.edu`), Department of Mathematics and Statistics, Mississippi State University, P.O. Drawer MA, Mississippi State, MS 399762. *Positive Solutions for Classes of Multiparameter Boundary Value Problems.*

In the recent past, many results have been established on non-negative solutions to boundary value problems of the form

$$
\begin{aligned}
-u''(x) &= \mu f(u(x)), 0 < x < 1 \\
u(0) &= u(1) = 0
\end{aligned}
$$

where $\mu > 0$. In this paper, we study classes of multiparameter problems of the form

$$
\begin{aligned}
-u''(x) &= \lambda g(u(x)) + \mu f(u(x)), 0 < x < 1 \\
u(0) &= u(1) = 0
\end{aligned}
$$

where $f(0) < 0$ and $g(0) > 0$. We will discuss existence, multiplicity, and nonexistence of solutions for ranges of $\lambda$ and $\mu$. We prove our analytical results via a quadrature method. Our results apply, for example, to the case when $f(u) = (u+1)^{\frac{1}{3}} - 2$ and $g(u) = u^3 + 1$, for which we also provide the complete bifurcation diagrams via numerical methods. (Received September 28, 2000)

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