EXISTENCE AND ASYMPTOTIC BEHAVIOR OF POSITIVE SOLUTIONS FOR A CLASS OF \((p(x), q(x))\) – LAPLACIAN SYSTEMS

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Abstract. In this paper, our main purpose is to establish the existence of positive solution of the following system

\[
\begin{align*}
-\Delta_{p(x)} u &= u^{\alpha(x)} + \lambda p(x) v^{m(x)}, \quad x \in \Omega \\
-\Delta_{q(x)} v &= v^{\beta(x)} + \theta q(x) u^{p(x)}, \quad x \in \Omega \\
u &= v = 0, \quad x \in \partial \Omega,
\end{align*}
\]

where \(\Omega \subset \mathbb{R}^N\) is a bounded domain with \(C^2\) boundary, \(p(x), q(x)\) are functions which satisfy some conditions, \(-\Delta_{p(x)} u = -\text{div}(|\nabla u|^{p(x)-2} \nabla u)\) is called \(p(x)\)-Laplacian. We give the existence results of positive solutions and consider the asymptotic behavior of the solutions near the boundary. The approach is based on the sub- and super-solution method.


Keywords and phrases: positive solution, \((p(x), q(x))\)-Laplacian, asymptotic behavior, sub-supersolution.

REFERENCES