

Eigenvalues of $-\Delta_p - \Delta_q$ under Neumann boundary condition

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Abstract. The eigenvalue problem $-\Delta_p u - \Delta_q u = \lambda |u|^{q-2} u$ with $p \in (1, \infty)$, $q \in (2, \infty)$, $p \neq q$ subject to the corresponding homogeneous Neumann boundary condition is investigated on a bounded open set with smooth boundary from \mathbb{R}^N with $N \geq 2$. A careful analysis of this problem leads us to a complete description of the set of eigenvalues as being a precise interval $(\lambda_1, +\infty)$ plus an isolated point $\lambda = 0$. This comprehensive result is strongly related to our framework which is complementary to the well-known case $p = q \neq 2$ for which a full description of the set of eigenvalues is still unavailable.