Spectral estimates of nonlinear elliptic operators in non-convex domains

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We study the Neumann eigenvalue problem for the nonlinear p-Laplace operator:

$$-\mathrm{div}(|\nabla u|^{p-2}\nabla u) = \mu_p |u|^{p-2} u \text{ in } \Omega, \ \frac{\partial u}{\partial n} = 0 \text{ on } \partial\Omega,$$

in bounded domains $\Omega \subset \mathbb{R}^2$ that satisfy the quasihyperbolic boundary condition. On the base of the geometric theory of composition operators on Sobolev spaces we give spectral estimates of the first non-trivial Neumann eigenvalue $\mu_p(\Omega)$ in the terms of the (quasi)conformal geometry of domains.

Based on joint work with [Vladimir Gol'dshtein and Valerii Pchelintsev].

Keywords: Elliptic operators, Sobolev spaces, quasiconformal mappings.