Sharp stability of higher order Dirichlet eigenvalues

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Let $\Omega \subset \mathbb{R}^n$ be an open set with same area as the unit ball B and call $\lambda_k(\Omega)$ the k-th eigenvalue of the Laplacian with Dirichlet condition on Ω. Suppose $\lambda_1(\Omega) - \lambda_1(B)$ is small, how large can $|\lambda_k(\Omega) - \lambda_k(B)|$ be ? We establish bounds with sharp exponents depending on the multiplicity of $\lambda_k(B)$ through the study of a perturbed shape optimization problem. This is a joint work with Dorin Bucur, Jimmy Lamboley and Raphaël Prunier.