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Numerical approximation of the first p -Laplace eigenpair for large p values

We present an alternating direction method of multipliers (ADMM) algorithm for approximating the first eigenpair of the p -Laplace operator with zero Dirichlet boundary conditions. In this talk we will discuss the $p \rightarrow \infty$ limit and its connection to the underlying geometry of our domain. Working with large p values presents numerical challenges against which the ADMM algorithm outperforms a Newton based solver, at least in certain cases. We show some preliminary computational results in 1D, planar domains, and surfaces lying in \mathbb{R}^3 .