

# BENCHMARK COMPUTATION OF EIGENVALUES WITH LARGE DEFECT FOR NON-SELF-ADJOINT ELLIPTIC DIFFERENTIAL OPERATORS

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In this talk we present benchmark problems for non-self-adjoint elliptic eigenvalue problems with large defect and ascent. We describe the derivation of the benchmark problem with a discontinuous coefficient and mixed boundary conditions. Numerical experiments are performed to investigate the convergence of a Galerkin finite element method with respect to the discretization parameters, the regularity of the problem, and the ascent of the eigenvalue. This allows us to verify the sharpness of the theoretical estimates from the literature with respect to these parameters. We provide numerical evidence about the size of the ascent and show that it is important to consider the mean value for the eigenvalue approximation.

## REFERENCES

- [1] R. Gasser, J. Gedicke and S. Sauter, *Benchmark computation of eigenvalues with large defect for non-self-adjoint elliptic differential operators*, SIAM J. Sci. Comput., 41(6):A3938–A3953, 2019.