Boundary element methods for Laplacian eigenvalue problems

THU/P2
12:00–12:20

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For the solution of Laplacian eigenvalue problems we propose a boundary element method which is used to solve equivalent nonlinear eigenvalue problems for related boundary integral operators. We use the concept of eigenvalue problems for holomorphic Fredholm operator functions to establish a convergence and error analysis for a Galerkin discretization of boundary integral operator eigenvalue problems. The Galerkin discretization of such problems leads to algebraic nonlinear eigenvalue problems which can be solved by iterative schemes. We analyze different methods as the inverse iteration, the Rayleigh functional iteration and Kummer's method. For the latter method we give convergence rates with respect to the multiplicity of the eigenvalues. Finally, numerical examples are presented which confirm the theoretical results.