Reduced basis method for non-symmetric eigenvalue problems: application to the multigroup neutron diffusion equations

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Résumé

In this seminar, a reduced basis method for parametrized non-symmetric eigenvalue problems arising in the loading pattern optimization of a nuclear core in neutronics is presented. To this end, a posteriori error estimates for the eigenvalue and left and right eigenvectors are derived. The practical computation of these estimators requires the estimation of a constant called prefactor,
which can be expressed as the spectral norm of some operator.

A practical method is proposed in order to estimate this prefactor which yields interesting numerical results on actual test cases. Numerical simulations are provided on examples including a multigroup neutron diffusion equation.

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