

Eigenvalue problems in high dimensions

Volker Mehrmann

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Abstract

Eigenvalue problems in very high dimensions are classical problems in quantum physics, but also in classical mechanics. While for large scale matrices good iterative methods are available, the situation is drastically different for large scale parametric eigenvalue problems and a resort to tensor methods is often the only alternative. We discuss extreme scale many-parameter eigenvalue problems arising from finite element discretizations of partial differential equations and how to use model reduction techniques to recover the important part of the spectrum.