

PDE EIGENVALUE PROBLEMS: COMPUTATIONAL MODELING AND NUMERICAL ANALYSIS

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ABSTRACT

Spectral analysis of differential operators provides important insight into the behaviour of physical systems, and is often essential in the design and optimization of such systems. Its central role in areas such as structural mechanics and quantum mechanics is well-established. Additionally, an appropriately chosen collection of eigenvectors is often very effective in significantly reducing the computational effort necessary to analyse complex systems. As such, the design and analysis of algorithms for computing eigenvalues and eigenvectors, as well as the extension to new applications, continue to be active and relevant areas of research, with significant room for further development.

The aim of this minisymposium is to present a broad survey of recent work on eigenvalue problems for partial differential equations, considering eigenvalue/vector computations both from the perspective of numerical analysis and in terms of applications for which such computations play an important role. Expected topics of discussion include: model order reduction, parameter-dependent eigenvalue problems, nonlinear eigenvalue problems, error analysis, self-adaptive approximation, and novel approximation techniques.