Multi-level solvers for large sparse linear systems

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Key Words:

ABSTRACT

Large sparse linear systems of equations with millions or even billions of unknowns arise in many scientific and engineering applications and require the use of iterative solvers. In order to facilitate scalability for such problem sizes and to efficiently run on the largest available supercomputers, multi-level approaches have to be employed. Essentially, these approaches are based on the construction of coarse approximations of the original finelevel problem.

This minisymposium addresses the most important and active research topics for scalable multi-level iterative solvers and preconditioners for sparse linear systems, including:

- domain decomposition solvers,
- geometric and algebraic multi-grid methods,
- matrix-based and matrix-free algorithms,
- adaptive coarse spaces, coarse spaces with additional constraints.

Possibly focusing on specific aspects such as:

- high-performance computing,
- emerging hardware architecture, e.g. accelerator devices,
- single and coupled multi-field problems,
- applications in natural sciences, engineering, and biomedicine.

The aim of this minisymposium is to provide a forum for young researchers to discuss promising developments and advances in multi-level solvers for large sparse linear systems of equations as well as challenges related to todays and tomorrows computing hardware. We also want to facilitate an open discussion on differences and commonalities among various classes of multi-level solvers.