

ADVANCES IN ITERATIVE SOLUTION METHODS FOR SOLVING COUPLED PROBLEMS

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ABSTRACT

Coupled problems are ubiquitous across many applications in computational physics and engineering. However, the coupling between different physical phenomena and spatio-temporal scales gives rise to strongly nonlinear, possibly non-convex, non-smooth, or highly ill-conditioned large-scale systems of equations, which require efficient solution strategies. In this minisymposium, we discuss the current state-of-the-art and emerging trends in designing efficient and robust methods for solving such systems of equations. The focus will be given on the robustness and the efficiency of the proposed methods, for example by exploring the structure/physics of the underlying problems.

We invite the contributions related, but not limited to:

- Preconditioning strategies
- Domain decomposition and multilevel methods
- Field-split methods
- Acceleration techniques
- Novel coupling strategies
- Parallel algorithms and high-performance computing
- AI enhanced numerical methods