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SECOND LEVEL PRECONDITIONERS FOR KRYLOV SUBSPACE METHODS

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ABSTRACT

Nowadays Krylov subspace methods are very popular to solve linear systems with a large and sparse coefficient matrix. Combined with a suitable preconditioner (block)ILU, Multigrid, SPAI, Domain. Decomposition etc. the methods are robust and efficient for many practical problems. However, for many problems, it appears to be beneficial to add a second level preconditioner. Examples of such problems are: problems with discontinuous coefficients, parallel Domain Decomposition preconditioners and time dependent problems.

Including a second level preconditioner the following choices are important:

- method: deflation, additive, balancing, or FETI,

- choice of vectors: domain based, physical, or approximate eigenvectors,

- implementation: amount of extra work, stability properties, etc.

In this minisymposium a number of papers is presented to illustrate the power and the properties of second level preconditioners.

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