ALGEBRAIC MULTILEVEL PRECONDITIONERS WITH AGGREGATIONS

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Abstract

Multilevel preconditioners can be used for solving systems arising from discretization of boundary value problems by the finite element method. Standard multilevel preconditioners use a hierarchy of nested finite element grids and corresponding finite element spaces. In some situations, it can be difficult or impossible to create such hierarchies. In these cases, it is still possible to construct similar hierarchies of spaces in algebraic way by aggregation. This approach can be used e.g. for both conforming and nonconforming linear finite elements and has several favourable properties discussed in the contribution. Beside preconditioning, both geometric and algebraic hierarchies can be also used for aposteriori error estimation.

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References

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