

Deflation Based Domain Decomposition Preconditioners

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Domain decomposition methods are widely used in applied mathematics and regarded as highly scalable algorithms, alongside multigrid methods. Making those methods scalable to thousands of processors is however not a straightforward task. Projection operators are one of the essential tools for achieving scalability: they are used for building deflation preconditioners. We will present a C++ framework accompanied by theoretical results to show how effective it can be to solve problems with billions of unknowns.