Multi-Level Extensions for FROSch - the Fast and Robust Overlapping Schwarz Preconditioner

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\section*{ABSTRACT}

The Fast and Robust Overlapping Schwarz (FROSch) preconditioner framework of the Trilinos software library contains a parallel implementation of the Generalized-Dryja-Smith-Widlund (GDSW) preconditioner \cite{1}. The GDSW preconditioner is a two-level overlapping Schwarz preconditioner with an energy-minimizing coarse space, which can be constructed algebraically from the fully assembled stiffness matrix. To reduce the size of coarse problem an additional level is introduced by applying the GDSW preconditioner recursively to the coarse problem \cite{2, 3}. The multi-level extension has recently been added to the FROSch framework. Further improvement to the parallel scalability can be obtained by applying a coarse space of reduced dimension (RGDSW) \cite{4}. In this talk, results obtained on the SuperMUC-NG supercomputer for up to 100K MPI ranks using the standard method and the multi-level extension will be presented showing the extended parallel scalability of the new methods.

\section*{REFERENCES}


