Trilinos/MueLu

Structured and unstructured aggregation-based algebraic multigrid (AMG) preconditioners

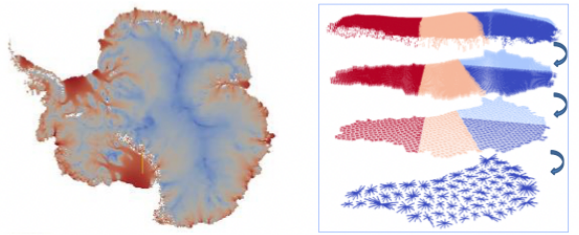
- **Robust, scalable, portable AMG preconditioning critical for many large-scale simulations**
  - Multifluid plasma simulations
  - Shock physics
  - Magneto-hydrodynamics (MHD)
  - Low Mach computational fluid dynamics (CFD)

- **Capabilities**
  - Aggregation-based coarsening
  - Smoothers: Jacobi, GS, /1 GS, polynomial, ILU, sparse direct
  - Load-balancing for good parallel performance

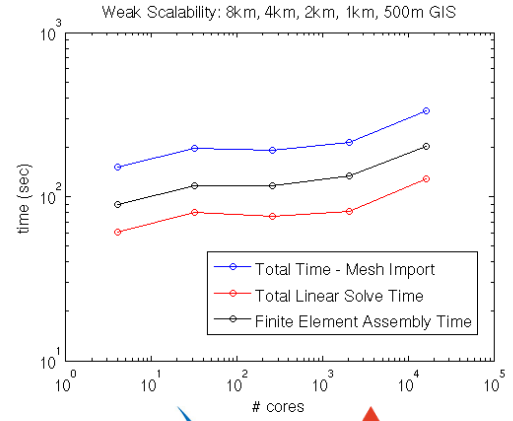
- **Research Areas**
  - Performance on next-generation architectures
  - AMG for multiphysics
  - Multigrid for coupled structured/unstructured meshes
  - Algorithm selection via machine learning

SAND2019-8938 PE

Image courtesy of Irina Tezaur (SNL). Semi-coarsening and scaling results courtesy Ray Tuminaro (SNL).



AMG operator-dependent semi-coarsening is key enabling technology in ASCR/BER ProSPect project's ice sheet simulations.



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ECP EXASCALE COMPUTING PROJECT

https://trilinos.github.io/muelu.html