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Sandia National Laboratories

Linear and Eigen-Solver Capability Area

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Trilinos Users Group Meeting

October 27th-30th, 2014

U.S. DEPARTMENT OF ENERGY

National Nuclear Security Administration

Packages in this Area

	Package	Compatible with	
		Epetra	Tpetra
Krylov solvers	AztecOO	x	
	Belos	x	x
Direct solvers	Amesos	x	
	Amesos2	x	x
	Pliris	x	
Incomplete factorizations, SOR, additive Schwarz	Ifpack	x	
	Ifpack2		x
Multigrid methods	ML	x	
	MueLu	x	x
Block preconditioners	Teko	x	
Eigen solvers	Anasazi	x	x
Hybrid Schur complement methods	ShyLU	x	
Equivalent real forms	Komplex	x	
Parameter list interfaces	Stratimikos	x	x

Updates with Trilinos 11.12

- MueLu – multigrid framework
  - Newly released
  - See Andrey Prokopenko's talk: 1:30pm Wednesday
- Anasazi – eigensolvers
  - New tracemin capability
  - See Alicia Klinvex's talk: 1:50pm Wednesday
- Amesos2 – direct solvers
  - KLU2 released (internal serial sparse solver)
- Belos – Krylov solvers
  - TSQR orthogonalization in pseudoblock GMRES

Some Upcoming/Ongoing Research

- **MueLu**
  - Explore using Kokkos directly in MueLu
  - Multigrid for higher order discretizations
  - Semicoarsening/line-smoothing
- **Ifpack2**
  - Solvers for constant block Tpetra matrices
  - See T. Fisher's related talk on Wedn. @ 2:20pm
- **ShyLU**
  - Multi-threaded incomplete factorizations
- **Communication-avoiding solvers**
- **User application talk**
  - Paul Atzberger: "Fluctuating Hydrodynamics Methods for Complex Geometries", today @ 11:15am