Contribution ID: **22** Type: **Talk**

Parallel multiprecision iterative Krylov subspace solver

Tuesday, 5 November 2019 14:50 (30 minutes)

The use of multiprecision numerics is becoming increasingly attractive as modern processor architectures often achieve significantly higher performance and throughput rates when using lower precision than IEEE double precision. Error analysis aims at investigating how rounding errors introduced by using different precision formats propagate throughout the algorithms and potentially impact the convergence of iterative schemes.

In my talk I present experimental results on using a multiprecision Arnoldi algorithm inside the GMRES iterative solver. Specifically, I analyze the scenario where the memory format for storing the Krylov-building system matrix is decoupled from the arithmetic format, and the memory access to the system matrix uses a more compact, lower precision format while preserving IEEE double precision in all arithmetic.

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Session Classification: Day I