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Parallel Preconditioners for GPU-Multigrid Solvers

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GPUs perform best on regular, independent work-loads while effective preconditioners ask for complex, serially coupled computations. The extreme cases of best hardware performance on slowly converging numerical schemes or quickly converging schemes with slow serial execution are poor choices. The talk discusses how to find the middle ground by challenging the hardware with more complex data dependencies and at the same time relaxing purely serial dependencies with parallel variants. For structured matrices, we can now solve very ill-conditioned linear equation systems that were intractable with GPU hardware before.