

## On Preconditioning and Recycling Subspaces Strategies for Multilinear Systems

Iterative linear solvers and strategies for accelerating their convergence have been extensively studied by researchers for many decades. Recently, two classes of iterative solvers for tensor-represented systems have proven their effectiveness in solving high dimensional problems. These are low rank Krylov-based solvers and alternating-least-squares-based solvers. Nonetheless, rounding the tensors, even with high accuracy, combined with the typical nature of badly conditioned operators seem to hinder their convergence. Hence, preconditioners and convergence acceleration techniques such as recycling subspaces are instrumental to have efficient solvers. Extending these strategies from the linear case to the multilinear case is not straightforward. In this talk, I will discuss the related difficulties and give solutions to some of them and perspectives to what might be the way to tackle the others.

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