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Krylov Subspace Recycling For Matrix Functions

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We discuss a new augmented Krylov subspace method which allows for the efficient evaluation of a sequence of matrix function applications on a set of vectors using Krylov subspace recycling. If selected appropriately, the recycling subspace can be used to accelerate the convergence of each problem in the sequence, leading to an overall reduction in the computational overhead required to evaluate the full sequence of function applications, in comparison to standard Krylov subspace methods. We present results of numerical experiments demonstrating the effectiveness of the method using examples from practical applications such as Quantum Chromodynamics.

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