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# On the Reuse of Standard Preconditioners for Higher Order Time Discretizations of Parabolic PDEs

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In this work we study preconditioned iterative methods for some higher order time discretizations of parabolic problems. The preconditioner is optimal with respect to spatial discretization parameters and time stepping parameters. We use Padé approximations of the exponential function to discretize in time. Standard preconditioners for low order time discretization schemes, such as Crank-Nicolson and implicit Euler, can be reused as preconditioners for the arising systems. We present both theoretical and numerical results.