

## A Parallel in time algorithm based ParaExp for Optimal control problems

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### Résumé

In this poster, we will present a new parallel-in-time algorithm for solving optimal control problems constrained by partial differential equations. This approach, based on a deep understanding of ParaExp, considers an overlapping time-domain decomposition in which we combine the solution of homogeneous problems using exponential propagation with the local solutions of inhomogeneous problems. The algorithm yields a linear system whose matrix vector product can be fully performed in parallel. We then propose a preconditioner to speed up the convergence of GMRES in the special cases of the heat and wave equations. We provide some numerical experiments to illustrate the efficiency of our preconditioners.