1046-65-767 **Daniel B Szyld*** (szyld@temple.edu), Temple University, Department of Mathematics (038-16), 1806 North Broad Street, Philadelphia, PA 19122. *Application of inexact and truncated Krylov subspace methods to the solution of parabolic control problems.* Preliminary report.

We discuss the use of state-of-the-art Krylov Subspace Methods for the solution of certain large scale optimization problems governed by parabolic partial differential equations. We present recent results on inexact Krylov subspace methods, in which the matrix-vector product at each step does not need to be computed exactly. In fact, these products can be more and more inexact, as the iteration progresses. When the matrix in question is in product form with one or more implied solution of (inner) linear systems, these systems can be approximated less and less accurately as the iteration progresses. Computable inner stopping criteria were developed to guarantee convergence of the overall method. We will discuss these criteria, and illustrate its application to parabolic control problems, where the reduced Hessian has two different inverses; and thus two inner iteration criteria are needed. Truncated methods are also discussed. (Received September 11, 2008)