1077-65-2038 **Xiuhong Du*** (du@alfred.edu), Alfred University, Division of Mathematics, One Saxon Drive, Alfred, NY 14802, and **Daniel B Szyld**, Temple University, Department of Mathematics, 1815 North Broad Street, Philadelphia, PA 19122. *Varying Iteration Accuracy Using Inexact Conjugate Gradients in Control Problems governed by PDE's.*

This paper considers the solution of certain large scale optimization problems governed by parabolic partial differential equations. A quadratic functional containing a data misfit term is minimized to approximately recover the parameter function. The resulting constrained optimization problem is solved by using the reduced Hessian approach. The conjugate gradient method is employed for the solution of the system involving matrix-vector multiplications which are nontrivial. These matrix-vector products do not need to be computed exactly. In this paper we develop a new computable criterion to establish the allowable reduction of exactness in the matrix-vector product. We show its general application and in particular to the problem at hand. Numerical experiments show that the new computable criteria is effective while other criteria normally used are not as efficient.

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