

# INEXACT KRYLOV SUBSPACE METHODS FOR LINEAR SYSTEMS

Gerard Sleijpen (joint work with Jasper van den Eshof)

## Abstract

There is a class of linear problems for which the computation of the matrix-vector product is very expensive since a time consuming approximation method is necessary to compute it with some prescribed relative precision. In this talk we investigate the effect of an approximately computed matrix-vector product on the convergence and accuracy of several Krylov subspace solvers. The obtained insight is used to tune the precision of the matrix-vector product in every iteration so that an overall efficient process is obtained. These strategies can lead to considerable savings over the standard approach of using a fixed relative precision for the matrix-vector product in every step. One result of our analysis is an improved version of a strategy of Bouras, Frayssé and Giraud for the Conjugate Gradient method in case of Hermitian indefinite matrices.