

In this work we study the solution of linear approximation problems with multiple observations. Particulary we focus on the total least squares method, which belongs to the class of orthogonally invariant problems. For these problems we describe the so called core reduction. The aim is to reduce dimesions of the problem while preserving the solution, if it exists. We present two ways of constructing core problems. One is based on the singular value decomposition and the other uses the generalized Golub-Kahan iterative bidiagonalization. Further we investigate properties of the core problem and of the methods for its construction. Finally we preform numerical experiments in the Matlab enviroment in order to test the reliability of the discussed algorithms.