ON TOTAL LEAST SQUARES FORMULATION IN LINEAR APPROXIMATION PROBLEMS WITH MULTIPLE RIGHT-HAND SIDES

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Abstract

Consider an orthogonally invariant linear approximation problem $Ax \approx b$. In [3] it is proved that the partial Golub-Kahan bidiagonalization [1] of the matrix $[b, A]$ determines a *core approximation problem* $A_{11}x_1 \approx b_1$ containing the necessary and sufficient information for solving the original problem. It is shown how the core problem can be used in a simple and efficient way for solving different formulations of the original approximation problem.

In this contribution we concentrate on the total least squares formulation [2] of a linear approximation problem $AX \approx B$ with *multiple right-hand sides*. Here a concept of the solution, and, consequently, of a minimally dimensioned approximation problem containing the necessary and sufficient information for solving the original problem, is still under development, cf. [4].

We will discuss several difficulties which have to be resolved in formulation of the total least squares problem with multiple right-hand sides, and investigate techniques that could possibly lead to an extension of the core problem theory.

References

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