On a new family of weighted total least-squares algorithms for EIV-models with arbitrary dispersion matrices

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For a long time, algorithms for the Total Least-Squares (TLS) solution within Errors-In-Variables (EIV) Models would only tolerate "element-wise weighting," which essentially amounts to the use of diagonal dispersion matrices without auto- or cross-correlations. This dilemma was overcome first by Schaffrin and Wieser (2008), and later by Fang (2011) as well as Mahboub (2012), who all allowed to handle more general dispersion matrices, while assuming invertibility and/or lack of cross-covariances.

Finally, in his PhD dissertation, K. Snow (2012) designed an algorithm that would generate the TLS solution even if the dispersion matrices are singular and cross-covariances exist, as long as a certain uniqueness criterion is fulfilled. Here, a new but related family of algorithms will be presented that are able to generate the (properly weighted) TLS solution with greater efficiency.

This is a joint work with K. SNOW (The Ohio State University and Topcon Positioning Systems).

References

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