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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Technical Note: Review of methods for linear least-squares fitting of data and application to atmospheric chemistry problems" *by* C. A. Cantrell

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I really welcome this technical note, pointing out the peril if linear regression is used for cases where x variables have uncertainties, and giving recipes how to do it properly.

I just recently had the problem of fitting a line, where x and y where data of same kind (instead of 'independent' and 'dependent' variables as in linear regression). Though I noticed the shortcomings of linear regression (by switching x and y, results changed considerably), and wanted to perform a kind of 'symmetrical fit', it took me some effort to find it in the literature. I think one reason that these methods are rather unknown is the fact that several people from different fields suggested algorithms that lead to

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equivalent results, but are given different names, and are noticed by different communities.

However, as far as I could investigate, 'total least-squares' (TLS) is an often used term (as noted in the introduction). I suggest to add a reference to 'Overview of total least-squares methods' by Markovsky and Van Huffel, Signal Processing 87 (2007) 2283-2302. As far as I can judge, this is a recent comprehensive overview of TLS algorithms that also points out some mathematical relationships between different approaches.

Another term often used for these kinds of algorithms seems to be 'orthogonal regression'; this could be added in the introduction.

I hope that the awareness of the need for these algorithms will rise in future, and will lead to implementation in the standard software packages.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 6409, 2008.

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