

## ***Interactive comment on* “Evaluation of linear regression techniques for atmospheric applications: The importance of appropriate weighting” by Cheng Wu and Jian Zhen Yu**

### **Anonymous Referee #1**

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The paper is an extension of the work by Saylor et al. (2006) and shows that ordinary least squares (OLS) techniques are not the best techniques in comparing two variables which both have errors in measurements.

The paper is well written and the science is good.

However, one can discuss the 'new science' of the paper. What is discussed in the paper, that OLS is a flawed method for comparing variables with errors, should be known to many researchers. However, reviewing the literature, one can see that it is not as widely known as it should be. Indeed, the OLS is often still abused in literature. Therefore, if this paper manages to increase the knowledge in using better regression

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methods for these cases, it will have served its purpose. As a result, despite the lack of a lot of 'new science', I would still accept the paper, albeit when another case that is lacking now is discussed. Discussion of this case would improve the usefulness of this paper strongly in my opinion: OLS is still widely used when comparing for instance model and measurement data. It would be interesting to add such a case, where the a priori error in one of the variables is unknown. What regression techniques would then be ideal? This can happen too with measurement techniques, if for instance, the technical errors of a measurement described cannot be trusted. And what is the best technique if the errors on both the independent and the dependent variable are unknown? How to proceed in that case?

Adding this discussion would, in my opinion, improve the manuscript.

Technical point: Last sentence of §3.1.2: meaning of SI?

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