Interactive comment on “Evaluation And Attribution Of OCO-2 XCO₂ Uncertainties” by John Worden et al.

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Received and published: 14 November 2016

We would like to thank the reviewers for their comments, especially reviewer 1 for their analysis on modeled XCO₂ variations at very fine length scales.

We have repeated reviewer 1’s analysis and while we get different numbers for the distribution of slopes (we get ∼1 ppm versus their ∼2ppm over land), we do get similar distributions for the STD within a small area.

As Reviewer 1 indicates this means that one of our primary assumptions, that XCO₂ varies less than the uncertainties no longer applies.

On the one hand this means that the observed XCO₂ variability is likely due to real XCO₂ variations. This is a good result for OCO-2! Furthermore, our result about the measurement error (from noise and natural variability) is still valid.

On the other hand, it is much more challenging to bound the role of interference error within a small neighborhood.

We are therefore looking at two approaches 1) Evaluating the correlation length scales of potential interferences by using the OCO-2 retrieved and a priori and asking at what point they are de-correlated from XCO₂ variations and 2) Asking if we can provide an upper bound on the role of interferences within a small neighborhood.

We therefore request more time (until after the holidays) to re-evaluate these uncertainties and furthermore request the same reviewers given that they are already vested in the analysis.