

## ***Interactive comment on “On sampling bias adjustment for sparsely observing satellite instruments for the example of carbonyl sulfide (OCS)” by C. Kloss et al.***

### **Anonymous Referee #1**

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This manuscript describes a method to adjust OCS measurements from ACE-FTS to decrease the sampling bias when creating climatologies.

My main concern with the paper is the wider applicability of the method which the authors claim to discuss in section 5 (the conclusions section). However in that section, they only have the following sentence: "We expect the method to be applicable in the construction of climatologies for tracers with variabilities on similar scales, including most compounds for which climatologies from ACE-FTS data have been compiled by ..."

To be acceptable for publication, the authors should showcase that their method works

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for other molecules, like O<sub>3</sub> and H<sub>2</sub>O (the molecules used by Toohey 2013), specially considering the next line in the conclusions: "Even though it is important to consider the sampling pattern of satellite based measurements, which leads to a sampling bias, at least for OCS the influence of the sampling bias is too small to significantly alter the scientific conclusions of climatologies." That is, the authors showcase their method to correct sampling biases in a molecule which does not have any significant sampling biases. The authors should either use model outputs sampled as performed in previous studies to prove the applicability of their method, or, construct O<sub>3</sub> and H<sub>2</sub>O climatologies using all the available MIPAS measurements and those closest to the ACE-FTS measurement locations.

Specific comments:

Section 2.1 Mention the horizontal sampling of ACE-FTS for consistency with the MIPAS section.

Equation 2: where is the longitude information coming from. The model explained in section 2.1 is a 2D (time and latitude) regression.

Figure 2(right): Why is this regression model “Bodeker”

Figure 6: please use different symbols for the unadjusted and adjusted comparisons. Also bigger the symbols.

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