

## ***Interactive comment on “Estimation of atmospheric total organic carbon (TOC) – paving the path towards carbon budget closure” by Mingxi Yang and Zoë L. Fleming***

### **Anonymous Referee #1**

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The authors employ a new catalyst based approach to measuring TOC+CO in ambient air (with co-location of high-precision measurements of CO<sub>2</sub> and CH<sub>4</sub> which allow the subtraction of these species). Measurements of TOC are much-needed and though there are limitations to these specific measurements, this manuscript describes an interesting new approach to TOC measurements and a straight-forward application to a marine site.

I have only minor suggestions and requests for clarification:

1. Given the novel measurement approach it seems this should be described in the abstract (brief description, precision, comment on whether all species are comprehen-

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sively detected – see comment #2).

2. Section 2: The authors mention the inlet and briefly allude to SV/IVOCs and aerosols in the text (lines 100, 123-126). The manuscript would benefit from more discussion of this, but most importantly, the authors should reiterate these gaps in the conclusions and abstract. Ultimately the reported TOC is not comprehensive and this should be made clear to the reader, with appropriate suggestions for assessing the degree of comprehensiveness and/or improving the instrumentation in the future (as given on lines 308-309).

3. Section 2.1: There is some ambiguity of units in this section between ppb and ppbC and it would be useful for the units of all quantities to be carefully defined (line 115). I believe that some quantities are incorrectly given as ppb instead of ppbC (line 131, 135, 141, 145, 148, 151, 155), though it's not always clear from the text. Please correct as necessary.

4. line 84: I suggest you place “e.g” in front of the Nolscher et al. reference since many studies have discussed the “missing OH reactivity”

5. line 194: September 8-10 also looks windy and rainy from the plots. Why aren't these dates included here?

6. Figure captions: I recommend adding the measurement location to the captions so that the casual reader is clear that these represent field measurements at a given site.

7. Figure 7, Figure 9, and lines 225-226, 250, 263: These scatter plots show some relationships, but the correlation appears quite weak. Please include the R<sup>2</sup> on the figures and temper the text accordingly.

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