

## ***Interactive comment on “A numerical evaluation of global oceanic emissions of $\alpha$ -pinene and isoprene” by G. Luo and F. Yu***

**Anonymous Referee #2**

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This manuscript uses OOMPH observations to contrast bottom-up and top-down estimates of the oceanic sources of isoprene and alpha-pinene. The very large discrepancies they find in particular for alpha-pinene highlight how little is known about this source and the importance of obtaining additional measurements over the open ocean in future campaigns. The manuscript is clear and to the point. A few suggestions and comments are included below.

### Major Comments

1. Section 1 & 2: no information is provided on assumed sizes for oceanic OC in previous studies. Presumably this would have important implications for mass emissions (if say, a fraction were in the coarse mode). A sentence detailing this would be helpful.

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2. Page 20726, line 25 and page 20730 line 17 : “full organic chemistry” seems like a bit of an overstatement. Global models include only simplified descriptions of chemistry. Please be specific here about the mechanism used, and/or the relevant chemical processes included for your study.

3. Section 3: There was no discussion here of the scales of variability in the observed VOC concentrations. It seems that both concentrations, as well as driving factors such as winds, chl-a, etc. could vary substantially on the 4x5 model grid scale used here. Please comment.

4. Section 3 & Figure 3: It's not at all clear why the authors include SOG in their discussion here. I recommend changing all values and figures to show only SOA concentrations.

### Minor Comments

1. Abstract, line 12: grammar, “the importance of carrying out”

2. Figure 2: It would be helpful to show the OOMPH cruise tracks on one of these panels so that the reader has a better understanding of the region sampled.

3. Page 20730, line 12: grammar, replace “yielding of” with “yield from”

4. Page 20730, line 13-14: grammar, “Experimental studies estimate that the SOA yield from alpha-pinene. . .”, rather than “Experiment studies implicated”

5. Page 20731, line 3: grammar, “which are produced from” instead of “which are yielded from”

6. Page 20731, line 8: grammar “the marine boundary layer”

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