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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Investigating sources of gaseous oxidized mercury in dry deposition at three sites across Florida, USA" *by* M. Sexauer Gustin et al.

Anonymous Referee #2

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In this paper, the authors analyze direct and indirect measurements of GOM at three locations across Florida. The authors examine the potential sources of GOM by looking at diel and seasonal variations as well as correlations with other pollutants. They further examine some of the common factors in large GOM events in terms of meteorology and pollutants. This is an interesting paper. I have a number of comments for the authors to consider:

1. Abstract. I agree with reviewer 1 that the abstract should be rewritten. The introductory material takes 60-75% of the abstract, with only very little actual results described. More emphasis should be put on quantitatively describing the results.

2. Page 18292 line 12. “the Hg input” is that total Hg or only reactive Hg?

3. Page 18294, section 2.3. What values were used for the GOM and SO2 thresholds? I didn’t quite follow what is the difference between unclassified GOM events and Class 2 events. Class 2 events fulfill the GOM criteria, but have SO2 concentrations less than the mean SO2 and wind directions from outside the ranges of Class 1. This description sounds the same to me as that for Unclassified events, but I must have missed something... Some clarification in the text would be useful (for example, are these events with high SO2 but wind directions not coming from a power plant?).

4. Page 18296. Lines 20-24 and rest of section 3.1. It would be useful for the authors to give quantitative values instead of only using qualitative statements “greater than, lower than, highest, lowest...”. What are the annual mean values, seasonal values, etc...?

5. Page 18297. Line 10. “a slight peak in SO2 concentrations ....” The mobile source contribution is more obvious from the large NO, NOy and CO morning peaks than from the “slight peak in SO2”.

6. Page 18299. Line 22 “We suggest here that in situ oxidation of GEM associated with mobile source pollutants is an additional factor to consider as a mechanism for production”. This is an interesting suggestion. Could the authors be more explicit as to the basis for that suggestion? Correlations? Diel cycles? Typically, NO (without concurrent SO2 enhancement) is a good tracer for fresh mobile source emissions, yet as far as I can tell Table S2 shows no correlation with GOM. Similarly, the diel cycles indicate little correlation of GOM with the morning rush NO peak.

7. Table S2. I was surprised to see that most of the values in this table are bold, even with very low r2 (<0.01).

8. Page 18306 line 23 “panels c and d; Fig. 7”. Should this be Fig. 5?

Figure resolution. Most of the figures have insufficient resolution and even enlarging

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them considerable on a large screen, it was difficult to read them (especially the small font text for Fig 1, 2, 3, 5-7). I suggest using higher resolution and increasing font size.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 18287, 2012.

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