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Interactive comment on “Variations of surface ozone at leodo Ocean Research Station in the East China Sea and influence of Asian outflows” by J. Han et al.

Anonymous Referee #2

Received and published: 26 August 2015

This paper is a concise, worthwhile analysis of tropospheric ozone in East Asia that should represent a valuable addition to the ozone literature. With a few exceptions, the language and conclusions are clear and well-supported. I recommend publication, following some additional refinement.

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1 Overall Comments

1. While the analysis of air mass trajectories was appropriate and interesting, I was disappointed to see very little mention of any other meteorological factors, despite their availability. Were the influences of the other meteorological observations taken at the IORS station (listed in the methodology section) examined along with wind speeds? What about weather conditions at other stations upwind? As it stands, only the effects of precipitation are directly described at all, and then only in a qualitative fashion. Whether or not other meteorological factors prove to be important here, I would expect at the very least some more substantial discussion of their significance (or lack thereof).
2. The figures in general show varying degrees of polish and clarity, and some of them are in need of attention. Unifying colors between figures, matching colorbar scales, and lining up axes within multipanel figures would go a long way towards improving their overall effectiveness (see specifics below).

2 Specific Comments

1. Abstract, page 16748, line 15: The phrase “of which extent was apt to be changed by” is awkward. I suggest “the extent of which was affected by”.
2. Introduction, page 16749, lines 2-3: This sentence implies that deposition is the dominant sink of tropospheric ozone, which I do not believe is the case. Please support and clarify this statement.
3. Section 3, page 16752, line 9: I believe “IORS including other remote sites” should read “IORS and other remote sites”.

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4. Section 3, page 16752, lines 13-20: There seems to be some redundancy here, with two pairs of sentences essentially saying the same thing: “highest O3 concentrations were mostly observed in spring with an apparent minimum in summer” and “this is a typical pattern” vs. “monthly averaged O3 concentrations were the highest in April and October and lowest in July” and “This accords with what has been observed”. Consolidate or further differentiate the repeated statements.
5. Section 3, page 16752, lines 22-23: Here there is a hint of temperature dependence, but no explanation of what the data show or whether the temperature/ozone relationship matches up with expectations. Is there a positive temperature correlation during clear days?
6. Section 4.1, page 16754, line 3: Fix typo (“1500ma.s.l.w.e.re calculated”).
7. Section 4.3, page 16756, lines 20-21: Please clarify the sentence “It is not certain for a higher and lower frequency of NW2 and W in 2004 than in other years.” I am not sure what it means.
8. Figure 4b: I think including (essentially) 4 y-axes is a bit much. These would be much clearer separated out into 4 vertically-stacked panels.
9. Figure 5a-e: Colorbars are all of varying scale, reducing the effectiveness of seasonal comparison. I recommend unifying the scales under a single colorbar and (if possible) getting rid of any tiny, extraneous text that is cluttering up individual panels.
10. Figure 5f: The meaning of the stacked bar plots is difficult to interpret as presented. I recommend turning them into a set of simple polar plots, such as those produced by the windRose function of the openair package.
11. Figure 6: I was distracted by the unaligned axes in the panels of this figure. Clean up placement.

12. Figures 9 and 10: Unifying the color scheme used here with that of Figure 7 would greatly improve the clarity of all three, making it easier to flip back and forth between them.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 16747, 2015.

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