

Interactive comment on “Impact of Siberia forest fires on the atmospheric environment over the Korean Peninsula during summer 2014” by Jinsang Jung et al.

Anonymous Referee #2

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General comments:

This manuscript classifies two haze episodes in Korean Peninsula based on different sources, one is from the Siberia forest fire during the late July, 2014, and the other one is from urban and industrial complexes in the East China during the mid July. It also characterizes the chemical compositions of the pollutants during these two haze episodes. This manuscript is well organized, however the presentation of the results part should be improved. You should describe the figure first before you use the information of the figure to support your conclusion.

I have some concerns about the scatter plots in Figure 11. First, I don't know what black circles represent for. I couldn't find description of the black circles anywhere. Second,

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the authors mentioned “positive correlation”, “poor correlation”, or “good correlation” many times, however, it is not convincing to find correlation from only two or three samples. Here, more samples are needed to draw the conclusion on the correlation. Thus, this analysis is not a good support to his conclusion. Third, if you want to show the trends between different chemical compositions, the scatter plot is still not a good tool. Without the time and location of each sample, and so few samples, how could you know the trend is increasing or decreasing with time?

This manuscript actually covers two haze episodes in every analysis and show chemical composition impacts in both haze episodes. Why does the title only include the part of Siberia forest fires?

Overall, I suggest publishing this manuscript after revision based on the comments above and below.

Specific comments:

Line 57. Define PM10.

Line 96. You have to mention that the anthropogenic pollution episode is not in the same period as smoke plumes pollution episode.

Section 2. There are a lot of observations from different sites, and those observations are used in different analyses of this study. I couldn't remember where they come from when I read the later results. I suggest making a table to describe the observation data, include information like where do they come from, site numbers, collecting method, sample frequency, used in which analysis or which figure, etc.

Line 202. The authors only mention two peaks and ignore the peak on 2 July. If you don't want readers to focus on the first peak, you can show the period from 8 July to 31 July. At the beginning of the results section, it is weird to only mention the point that authors want to focus on without explanation of the whole picture. You also need a leading sentence at the beginning of section 3 or at the end of section 3.1 to inform

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that you will focus on the “first” and “second” episodes and you are going to show this and that, since you have a very long result section.

Line 220-222. Where did you initialize the HYSPLIT backward trajectories? Did you randomly choose one location in Korean Peninsula or a site location? This information is not mentioned here or in section 2. It is the same issue for Fig 7. The trajectories may pass some parts of the forest, but it is not obviously to see the trajectories pass the red dots from Fig 3a. Maybe there are some red dots covered by the cloud that I couldn't see. The map is not very clear.

Line 234. ADO has dropped to less than 0.5 at late 25 July (Fig 5), and then it increases again. Can you explain this?

Line 237-239. The authors demonstrate that the smoke plumes from Siberia fire would impact Korean peninsula on 27 July and 28 July in the whole manuscript. However, here the authors said the results implied one-day transport. I'm not sure which one is the real conclusion. Moreover, the author concluded that the sharp increase in Ussuriysk site in 24 July was due to the Siberia forest fire without showing any evidence. Is it possible that this sharp increase is due to other sources?

Line 240-249. Poor description. First, describe left column, and then describe right column. Does the right column only represent the Total Attenuated Backscatter along the yellow lines? How did the authors define the paths of yellow lines? All these information should be included in the description.

Line 329-335. Are there only 3 points for Chinese haze episode and 2 points for Siberia forest fire episode? There are too few samples to get any meaningful correlation.

Line 336. “Good correlations”. Add the values of the correlations. Please be quantitative.

Line 338. “different correlation patterns”. I didn't see obvious difference from the figure. Could you describe more clearly about the patterns' difference?

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Line 349. “Poor correlations”. Please be quantitative.

Figure 12. I suggest changing the color of the last bar in order to distinguish this study from other referenced studies.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2015-1022, 2016.

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