

**Interactive comment on “One-year observations of carbonaceous and nitrogenous components and major ions in the aerosols from subtropical Okinawa Island, an outflow region of Asian dusts” by B. Kunwar and K. Kawamura**

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This is a useful dataset for modeling studies dealing with trans-boundary pollutants transport. In our previous reports it was found that the atmospheric deposition fluxes of carbon, nitrogen and sulfur in Northern China categorized as high levels, and compared to or higher than those documented in Europe, North America, and East Asia (Pan et. al., 2010, 2012 and 2013a). Although we did not measure the impact of atmospheric emissions from China on the surrounding areas, regional transport of toxic C8237 species was recorded periodically (Pan et. al., 2013b). I'd suggest providing more details about the effects of Asia dusts on the chemical composition of particles that collected at this downwind site. To improve the manuscript, a few comments and suggestions that I have regarding the paper are also presented below. Pg 22063, Ln 5-10: what is the sampling flow? Weekly used here is ambiguous. How long did the sampling last for, 7 days or few days in one week?

Response: All the samples last for seven days. To remove confusion, we have added following sentence. “The sampling period of each sample was 7days.” Please see line 88.

Pg 22063, Ln 15: How the field blanks were prepared?

Response: We have added following sentences in the revised manuscript. “Field blanks were also collected at the site. Blank filter was placed in the filter cartridge of sampler without pumping air. After 10 seconds, field blank filter was recovered from the cartilage.” Please see line 94 to 96.

Pg 22063, Sect. 2.2: How many ions were determined in this study? It is better to give the blank values and limit of detection of these species.

Response: Thank for your suggestion. Following the reviewer's comment, we have added following sentences in the revised manuscript. “We determined total 11 ions including methanesulfonate (MSA<sup>-</sup>). The detection limits for anions and cations were ca. 0.1 ng m<sup>-3</sup>. The field blanks for Na<sup>+</sup> and Ca<sup>2+</sup> are 0.078 and 0.144 ng L<sup>-1</sup>, respectively, whereas those for MSA<sup>-</sup>, Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup> and SO<sub>4</sub><sup>2-</sup> were 0.003, 0.01, 0.001 and 0.011 ng L<sup>-1</sup>, respectively. Here, we report the concentrations of all species after the blank correction.” Please see lines 131 to 135.

Pg 22065, Ln 21-22: This sentence is incomplete.

Response: We are sorry for this error. We rewrote the complete sentence. Please see lines 158 to 159.

Pg 22065, Ln 25: Na or Na<sup>+</sup>?

Response: Thank you for the comment. This is Na<sup>+</sup>. Please see line number 162.

Pg 22067, Ln 12: Is the aerosol loading weighted by a balance? If yes, at what conditions (T, RH)?

Response: Yes, it is. Aerosol loading was weighted by a balance at room temperature and 50% RH. Please see lines 101 to 103.

Pg 22068, Ln 11: EC value in winter here (0.37) is inconsistent with that of Table 1.  
Response: We are very sorry for this type error. Actually, this value is 0.70. Please see line 215.

Pg 22069, Ln25: Please define “WIOM” here.

Response: WIOM defines the water insoluble organic matter. Please see line 258.

Page 22070, Ln16: “. . . the average OC/EC ratios are 4.4 and 5.7, respectively.” Such information was mentioned above. It is better to remove either to avoid repetitive materials through the text.

Response: Thank you very much. We deleted the redundant word in the revised manuscript.

Pg 22070, Ln10: OC/EC ratios in this study ranged from 3.5 to 21. The ratio is higher than 2.0, a value which indicated the contribution of secondary organic aerosols. Does it mean that no primary OC emission was found in the target area?

Response: The ratio is very high. If we compare our data with the data from other sampling site, we can say most of them formed from secondary oxidation. Still we estimated some amount of POC, which also suggest that there may be some POC. Please see lines 232-233.

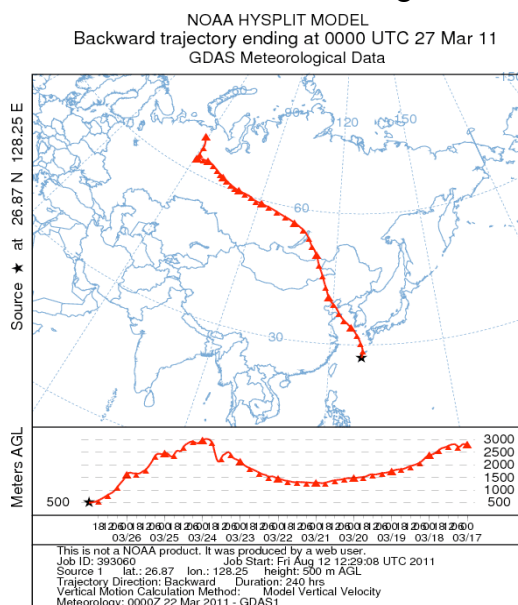
Pg 22071, Ln 16: “similar to those from Christchurch”, here “similar” is hard to follow.

Response: Thank you very much. We have remade the sentence. Please see line 304.

Pg 22073, Ln 12: was MSA– referring to Methane Sulfonic Acid (MSA). If MSA was measured in this study, please include it in the method section.

Response: MSA<sup>-</sup> referring methanesulfonate and determined by ion chromatograph. Please see line 132.

Pg 22073, Ln 9: MSA peaked in spring. It is NOT likely because the air parcels travelled over the urban region. This explanation is confusing, please clarify.



Response: Thank you very much. The springtime higher concentration of MSA<sup>-</sup> can be explained as follow. “During the long-range atmospheric transport, East Asian aerosols travelled over the marine regions (the East China Sea, Sea of Japan and Pacific Ocean) and resided over the marine atmosphere for 1 to 2 days. During the travelling, the aerosol from East Asia is mixed with marine aerosols emitted from the ocean, which can be supported by individual backward trajectory.”

Please see lines 352-356.

Pg 22077, Ln 22-25: Formula here is ambiguous, e.g., “[NO3-]+[nss-SO42-]” should be in brackets.

Response: We added the brackets. Please see lines 460 to 463.