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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Enhancements of Airborne Particulate Arsenic over the Subtropical Free Troposphere in the Springtime: Impact by South Asian Biomass Burning" *by* Yu-Chi Lin et al.

Anonymous Referee #1

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In this work, the authors choose Mount. Hehuan (3000 m asl) in Taiwan as a receptor site to collect the aerosol samples, with the emphasis on the potential long range transport. More than 300 filter samples were collected and analyzed. The authors found that much higher As occurred in Spring compared to other seasons, which was associated with the intensive biomass burning in South Asia. However, the biomass burning in SouthEast Asia (i.e. Indo-China Peninsula) did not release much As. In general, I think this work is well designed. The laboratory analysis (ions and elements), online observation in field (e.g CO) and modelling (WRF-Chem) were integrated from different aspects. And the finding of this work is meaningful for the scientists in the field of atmospheric chemistry and biogeochemical cycling of elements. But there are several

questions still exist in the manuscript and needed to be solved during the revision.

Specific comments: (1) Line 73-74, Actually, besides spring, the intensive biomass burning in India also happened in autumn (from late October to early November), due to the burning of rice (paddy) residue after the harvest. More information could be found in the literature, e.g. Eos, Vol. 95, No. 37, 16 September 2014. Crop Residue Burning: A Threat to South Asian Air Quality. (2) Line 109, Regarding the description of sampling site, it is better to note clearly that it is located in Taiwan. (3) Line 148, what is the recovery of As in the ICP-MS analysis? (4) Line 194, I think there is no need to mention Chongqing here. Maybe a broader geographic area like Sichuan Basin is better. (5) As shown in Fig 8a, during this period, why there is no firespots observed by MODIS in Southeast Asia. And please modify the Hehuanshan into Mount Hehuan in the figures. (6) Line 381, if possible, please provide more details about the usage of lead arsenate(LA) in South Asia, especially in the agricultural sector. What is the total amount of this insecticides used in South Asia every year? (7) In the future, maybe the authors could try to analyze the lead isotope in aerosol samples with high As concentration, to further reveal the source of Pb, as well as its relation to As.

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