

## ***Interactive comment on “Chemical composition and mass size distribution of PM<sub>1.0</sub> at an elevated site in central east China” by Y. M. Zhang et al.***

**Anonymous Referee #2**

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The manuscript attempts to characterize the mass concentrations and size distributions of chemical components in PM<sub>1.0</sub> at the summit of Mt. Tai by analyzing a year-long AMS dataset. The authors found that the annual mean mass concentrations of organics, sulfate, nitrate, ammonium and chloride at the summit were lower than those corresponding species at the nearby surface rural sites. They identified semi-volatile and low-volatile oxidized OA accounting for most of OA and at least 50 % of OA could be SOA. They concluded that those observed aerosols could be relatively aged and well-mixed. The study is interesting and scientifically sound. The reviewer has a few minor comments for the authors considering before publication.

1) Page 15193, line 9, what does it mean “cloud-nucleating ability”? 2) Page 15193, line 14, “ S. Asia” what’s this? 3) Page 15193, the second paragraph, it does not read C4599

well and needs to be re-organized. 4) Page 15196, section 2.2, the maximum size for SMPS is about 520 nm, the authors should explain how to calculate PM<sub>1.0</sub> mass from SMPS measurements. 5) Page 15196, section 2.3, the authors try to interpret how to differentiate the air mass from the PBL vs. from the FT, but it is hard to follow. 6) Page 15197, section 3.1, what are those criteria and objectives for the comparison? More interpretations are needed. 7) Page 15199, the top paragraph, it is difficult to follow because of the language. 8) Page 15199, Section 3.3., the technical terms such as “fresh aerosols” and “aged aerosols” are usually used for those from primary sources. New particle formation events are of course subject to secondary origins of aerosols. The authors should consider revising the part. 9) Page 15200, the second paragraph, no conclusion? For the third and fourth paragraph, the reviewer has difficult to link those piece-by-piece analyses with the conclusion. 10) Page 15201, Section 3.4, short distance is not defined? 11) Section 3.5, what are new findings?

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