Atmos. Chem. Phys. Discuss., 10, C1238–C1239, 2010
www.atmos-chem-phys-discuss.net/10/C1238/2010/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Size distributions of dicarboxylic acids, ketoacids, α-dicarbonyls, sugars, WSOC, OC, EC and inorganic ions in atmospheric particles over Northern Japan: implication for long-range transport of Siberian biomass burning and East Asian polluted aerosols" *by* S. Agarwal et al.

Anonymous Referee #2

Received and published: 5 April 2010

The manuscript of Agarwal et al. presents detailed size-segregated chemical analysis of aerosol in North Japan, indicating the importance of Siberian biomass burning, Asian pollution and marine aerosol on the aerosol properties of the Pacific rim. Size-resolved methods show how biomass burning samples especially will impact the region. This hypothesis is well-supported with tracers and back trajectory analysis, and literally has

far reaching effects, as North America and the Arctic have recently shown sensitivity to Siberian biomass burning. Overall, I recommend minor grammar revisions and the need to address two points as follow:

- Much of the argument depends on 10-day back trajectories. Many studies have used 10-days, but a significant amount of uncertainty is introduced with every day back the model is run. If the authors are suited to use 10-days, they must state why it is justified to the readers and briefly explain this caveat. Also, the dynamic requirements should be stated (i.e. are they isobaric or isentropic, so future studies can repeat the tests)

- The marine influence was briefly described, but deserves more attention as recent studies, especially Russell et al 2010 (PNAS) have identified sugars and polysaccharides in sea salt spray. This source of OM might not be observed or relevant in Japan, but these results should be put in context with other marine OM (O'Dowd, Leck and Bigg) studies. Is it possible that the sugars the authors claim are from dust and soil are from marine dissolved organic matter in the water?

- many errors in grammar were noted, and were uploaded as a pdf.

By addressing these points and fixing grammar, this paper should be suitable for publication.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/10/C1238/2010/acpd-10-C1238-2010-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 6713, 2010.