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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Organic condensation – a vital link connecting aerosol formation to climate forcing" *by* I. Riipinen et al.

Anonymous Referee #2

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The manuscript explores how the condensation of organic vapor controls the growth of newly formed particles. The study uses observations of new particle formation events to show that condensation of organic vapor dominates observed aerosol growth and that existing models of organic gas-particle partitioning do not reproduce observations.

The manuscript will be of interest to the community and should initiate further debate on how to simulate these processes in atmospheric models. The manuscript is well written. I find no major faults and recommend publication after the following minor comments have been accounted for.

Page 398, Line 21-26. Some additional information on the models and assumptions would be useful here as requested by referee #1, comment 2.

Page 399, Line 27. Soot is generally defined as a mixture of black carbon and organic matter. Is that what you mean here? Would it be more precise to refer to this as black carbon?

Page 401, Line 5. Why does the GR of 1.5-3 nm particles not have a seasonal dependence? You also show that sulfuric acid does not fully explain the growth of particles in this size range either so a seasonal cycle would be expected if the missing growth is coming from organics also.

Page 401, Line 7. What is the seasonal dependence of sulfuric acid? Since it is driven partly by OH which has a strong seasonal cycle this may also have a cycle that matches the observed cycle in GR.

Page 401, Line 19. Why were these 7 cases chosen?

Page 402. Is it possible to use the AMS observations to further confirm this large contribution of organics to the growing nucleation mode (> 20 nm particles)?

Page 403, Line 23. Should the following be removed: "see auxillary methods"?

Page 403 Line 21 onwards. It would be useful to give some numbers here. For example, what are the globally averaged percentage changes?

Page 404, Line 2. I assume you are referring to the first (cloud-albedo) aerosol indirect effect here. Please clarify.

The references need careful checking. I found a number of errors but did not do an exhaustive check:

Page 389, Line 19. Nel (2005) cited but not in reference list.

Page 399, Line 21. Typo. Should be Trivitayanurak et al. (2008) not be Trivitayanurak (2008)

P400, Line 4. Spracklen et al. (2006) cited but missing from reference list.

P400, L6. Vehkamaki et al. (2001) cited but missing from reference list. Should this be Vehkamaki et al. (2002)?

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 387, 2011.