

Interactive comment on “The direct and indirect radiative effects of biogenic secondary organic aerosol” by C. E. Scott et al.

Anonymous Referee #2

Received and published: 16 August 2013

Review of “The direct and indirect radiative effects of biogenic secondary organic aerosol” by Scott et al.

The manuscript presented by Scott et al. provides an extensive analysis of the micro-physical processes involved with CCN production from biogenic precursor emissions and the resulting radiative effects. The thoroughness of the paper combined with a concise and compelling writing style made the manuscript easy to follow. The results presented in the manuscript are highly relevant for both the modeling and understanding of the effects of biogenic SOA formation and the impact of SOA on global and regional climate. Scientifically, I find nothing wrong with the approach taken and therefore I suggest this manuscript for publication upon addressing some (very) minor revisions explained in more detail below.

C5940

Section 2.1.1. It is mentioned that there is substantial uncertainty in the yield of SOA generated by BVOC oxidation, but there is no discussion on why the specific molar yields (13% and 3%) were chosen for monoterpenes and isoprene.

Section 2.1.3. There is no mention of some form of ternary homogeneous nucleation as a possible nucleation mechanism. Possibly include a brief explanation as to why BHN was used as the base mechanism and not a more recent mechanism (or no nucleation whatsoever).

Section 3.1, paragraph 4. The authors could add a brief explanation of the decrease in CCN seen over eastern Asia in Figure 1.

Section 3.1, paragraph 5. The suppression of nucleation over ocean regions is part of the reason there is a decrease in CCN downwind of continental regions, however it is worth mentioning that wet deposition will efficiently remove CCN as well (with fewer small particles to grow to CCN sizes due to nucleation suppression earlier over the continents).

Section 3.1, paragraph 6. The authors could provide more details explaining why the CCN response saturates to SOA production yield.

Section 8. As a general comment, the authors could briefly discuss how the results of the numerous simulations performed could provide some guidance for future model development regarding biogenic SOA, especially for large-scale global modeling where the balance between computational costs and accuracy must be considered.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 16961, 2013.

C5941