

Interactive comment on “Size-resolved CCN distributions and activation kinetics of aged continental and marine aerosol” by A. Bougiatioti et al.

Anonymous Referee #2

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General: This paper reports on CCN results from the 2007 FAME campaign in Crete in terms of size-resolved activation and growth kinetics. The authors report highly hygroscopic particles with nearly 100% activation at higher supersaturations which is connected to the highly aged/oxidized nature of the air masses. Results also indicate that organics do not hinder growth kinetics of activated particles in this field study campaign.

Specific: A very detailed introduction sections is presented which references a great deal of related research. The introduction also explains that the current paper is a follow-up (with a sized-resolved, mixing state, and kinetic growth focus) to an earlier

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2009 paper by the primary author.

While sections 2.3 and 3.2 report on the chemical composition, it is difficult from the text alone to determine the particle makeup. Some figures or tables would be helpful to summarize the chemistry.

The use of super-script and sub-script "*" marks on kappa, S, E, and C is somewhat confusing and may be inconsistent in places - please double check these terms for accuracy and consider adding a short table defining these and other terms all in one place.

Page 12623 Line 8 mentions vertical error bars in Figure 9a which do not actually appear in the Figure.

Page 12623 Lines 22-23 mention Ra(S) substantially increasing after 14:00 H local time but this is not clear in Figure 9 which only plots E* and k*. Also, what is "substantially" if it is not obvious in the plots?

It is unclear what the difference is between Figure 10a and 10b - both report Sc ~ Sins but this seems to contradict the text on Page 12625 Lines 18-19.

Page 12627 Line 7 is missing a word after "oxidized".

Figure 1 - The text from page 12614 does not seem to match the HYSPLIT trajectories in terms of airmass source location and altitude - please clarify. Why was the trajectory done for 1 km altitude when samples were at ground level? This seems like an error.

Figure 6 - for 6(d), it appears that the 60 nm particles were more active than 80 nm particles which does not make sense or agree with other data presented - is this an erroneous data point?

Figure 8 - The figures are labeled a-e however the text says a-c and then uses the terms "left" and "right" - please be consistent with figure referencing.

Figure 9 - Why are the times in 4 hour labeled increments in plots b and d but in the

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awkward 4:48 increments in c and e? Please redo axis labels for consistency.

Figure 10 - The range of values in Figure 6(b) seems to be much larger than described in the text. From the figure, it looks like there may be growth kinetic limitations for many individual samples even if they balance out in the aggregate. Please clarify in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 12607, 2011.

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