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## ***Interactive comment on “On the submicron aerosol distributions and CCN number concentrations in and around the Korean Peninsula” by J. H. Kim et al.***

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This is a good and valuable manuscript that should be published after the numerous corrections that I am suggesting. Most of these shorten the manuscript as there are many unnecessary words. In most cases these are cosmetic changes but in a few cases the meaning was not clear before the corrections.

Change symbols for CCN concentrations at specific supersaturations from NCCN0.6 to N0.6% appropriately for all S; as per Hudson et al. (2010a & b, 2011a & b, 2012), Hudson and Noble (2014).

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P2, L4. Change for to with. Delete particle. Delete range. L5. Change are to were. L6. Delete respectively. Change are to were. L7. Delete respectively. Change are to were. L9. Insert the after of. L11. Delete the two. Insert (N0.6%) after S. L13. Change NCCN0.6 to N0.6%. L14. Delete the. Change are to were. L15. Move generally in front of show. Change its to this. L19. Move on a flight day after Sea. Change 2nd the to this. L23. Delete 1st two the. Change in to on.

P3, L2. Change on to to. Delete in general. L3. Change its to CCN. L3-4. Move, “due to...effects)” after community. L4. Change is to has. Insert been after not. Change within to to. Insert “, AIE” after effects. Period after community. Change but to Interest is. Delete last the. L5. Delete an. L6. Delete as a whole. Delete the. Delete required. L7. Change it to AIE has. Delete a. change on to about. L9. Change The aerosol indirect effects on climate to AIE. Change have to has. L10. Insert for before a. L11. Insert of before its. Move large in front of uncertainty. Delete is. Change when it comes to to for. L12. Delete the. Delete of the several. Reasons singular. Change behind to for. L13. Delete its. L14. Lifetime plural and move right in front of parentheses. Delete in the. Add ic to atmosphere. L16. Comma after Therefore. Data sets. L18. Delete problem. L20. Delete those in. L22. Delete the. L27. Change at to to. Delete ing.

P4, L1. Change aerosols to particles. Insert concentration after CCN. L2. Delete the. Change ese to a. delete continent. L3. Delete last the. L4. Delete at. L5. Delete the. Comma after Seoul. That to which. L6. City to area. L7. Delete which. Add ing to cover. Delete the years between. Change and to –. L8. Result plural. L10. Move then after we. Delete the. L11. Delete up. L13. Was the to are. Gradient plural. Delete last the. L14 region plural. The to a. L15. Delete last the. L16. Delete first The. L17. Delete first the. Delete over. L20. The to a. L21. Delete the. Those to data. L22. At to on. In to within. L24. Delete the. L25. The ones to those. L26. Delete us the. Delete the. Where to that. L27. Long to of.

P5, L1. CCN concentration to NCCN. In to within. Period after region. L1-2. Delete parentheses. L4. Delete cloud. delete 2nd the. Whose to with. Base plural. Delete

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is. L5. Move highly after be. L6. Retrieval plural. Delete the. Distribution plural. L9. Delete which the population is. Insert people after million. L10. Variation plural. Insert the before monsoon. L11. Delete a. L12. Measurement plural. Delete data for the period. L15. Distribution plural. Delete data. L15-16. Move “by TSI...respectively” in front of were. L17. At to in. In to on. Comma after campus. L18. Delete away, the, traffic. Road plural. L19. In to to. Delete and in the major road. L20. Distribution plural. Delete and. Since to from. L23. Insert a after through. Delete the. Delete in the air that went through it. L26. Since to from. The to a. L27. The to this. Delete last the.

P6, L1. Delete identical to the one. In to by. L3. A before total. L5. Distribution plural. Delete data. L6. Delete the. Optics to optical. Delete issue. Insert the after for. Insert that after CPC. Change arising to arose. L7. Change Average to Mean. Change value is to was. The to a. L8. Remove d from averaged. Last the to a. L9. The to a. L18. Delete respectively. L20. Ratio plural. L24. The one to NCN. Delete last the. L25. one to NCN. It to NCN. L26. Change at least by to more than. Move higher after two. Change the ones to NCCN. L27. Change that to NCCN.

P7, L2. Delete ly. L3. Insert a after as. Change a few to some. The to this. L4. And to with. L6. Quiet to quite. L7. It to This. L8. Insert a after as. Delete or not. L13. 2nd the to each. L14. The before number. L15. Change about twice higher than to double. L16. Delete 1st the. Emission plural. Might to may. L16-17. Change winter to wintertime and move in front of concentrations. L17. Delete in. are to were. Particularly to especially. L19. Delete the 3 times. L20. Insert The before Monsoon. L20-21. Move Seoul in front of precipitation. L21. Delete in. delete last the. L22. Amount plural. It to This. L23. Delete 1st the. L25. Of to for. L27. Occur to are.

P8, L1. Delete ly. Period after parentheses. Which to This. L3. Would to might. It to This. L4. Very to much. Add er to low. In to during. Period after months. Insert This would after period. Delete ing. L5. Delete value. L6. This is not a “power law relationship.” I recently reviewed a paper that took this literally and made a completely different relationship, which was not what Twomey did and was wrong. You are not

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doing this here but the word “power law” is inappropriate for this relationship. You need to define C; it is N1%. L8. If the to For. L9. Move the same in front of chemical. Delete is. L10. Change “particles that can be activated as cloud droplets at” to CCN. Insert “(with” before higher. Change S to Sc. Close parentheses. Change larger and vice versa to relatively greater. L12. Change particularly to especially. Delete the. L13. Portion plural. Required to had. S to Sc. delete to be. L14. Delete activated as cloud droplets. Period after small. Insert This after period. Implying to implies. L15. Insert especially for smaller particles after December. L16. In to during. L21. Delete one. Delete bin. For to of. Number plural. Change the data to measurements. L23. The to these. L25. Move for NCN to beginning of sentence. Delete the twice. Insert there are before mid.

P9, L1. Delete not very. Conspicuous to inconspicuous. Change never exists to absent. L7. Insert to in front of only. Delete for. L8. For different to with the. L9-10. Comment: But diesel vehicles are larger and consume more fuel. L12. Delete that of. Amount to minimum. Delete the after of. Delete that of. L13. Change amount to maximum. L14. Change amount in to during. L15. Concentration was to has been L16. Seems to is. L17. Emission plural. L18. From to of. Delete 1st the. Emission plural. L19. Or to and. L21. It to This. Ed to ing. L22. Cite Hudson (1991); see p2451 bottom of 1st column-top of 2nd column and Figs. 6 and 7.

P10, L10. It to the PBL. L11. The to a. reduces to lowers. Delete the height of. L12. Value to height. Add time to night. Insert (0-9) after period. L17. Fluctuation plural. L18-19. Is this total, seasonal or annual? L25. Time plural

P11, L1. Insert (panel d). L3. Insert for before the. L4. Expand to increase. Shrink to decrease. L6. Delete amount. L7. Importance for to influence on. L17. Delete respectively L20. Robert plural. L24. Delete the. Fluctuation plural. Delete with. L25. Insert were used after pump. L26. Fluctuation plural. Range plural L27. Move not after to. Fluctuation plural. Delete as well.

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P12, L2. In order after open. L4. The after on. L5. Delete away. L13. Gradient plural. L15. Delete 1st the. In to For. Delete out. L16. Following the to at. Delete line. Delete it reached. L19. Delete and. Change until it reached to to. L20. Which to this. Delete called. L21. Delete last the. Delete of. L21-2. Move altitude after m. L25. Delete the measurement.

P13, L7. Delete 1st the. Delete inal location. L9. Delete the twice. L10. Distinguished to used. L11. Could to can. Delete out. Insert overall before influence. Insert A before total. L13. Insert soundings before during. L17. Bin plural. L20. Delete the. Gradient plural. L23. Change the ones to NCN. L27. Delete also. Change the ones to those.

P14, L1. Delete was. L2. Delete their. L3. Delete a. L4. Change value for to of. L5. Remove s from represents. Mass plural. L6. CCN to NCCN. L7. Delete capability of aerosol particles. The to this. Urban to populated. L8. Delete more. L9. Delete the twice. L10. Delete the. Delete ly. L11. Delete ern. L12. Only to except. L13. Change suggesting to indicating. L14. Influence plural. Within to to. L15. Delete 1st the. L16. Less to fewer. Delete occurring. Delete the. L18. Insert of Fig. 11 after panels. L26. Tend. L27. Define M.

P15, L1. Change those to  $\sigma_{550}$ . L2. Change those to  $\sigma_{550}$ . L3. Delete in. L4. Delete 1st m. Altitudes singular. Delete reach. L5. Much to very. Delete the. L6. Insert for after except. Delete 2nd the. L11. Change vs. to and (twice). Insert between before 2nd  $\sigma$ . L12. Or to and. L12-13. Change, “and indeed seems to suggest that there is,” to “, which indicates.” L13. Change although the to with. Delete is large. L13-14. Delete sentence. L16. Insert , red after m. L17. There is no solid line. There is a dashed line. Is this a regression? Delete last the. L18. Delete quite significantly. L19. Change correspondence to increase here. Delete almost. L22. Change flights to regions. L23. Insert is after  $\sigma_{550}$ . Move smaller after is. L25. Add ship to relation. Delete last the. L27. Delete in the future.

P16, L4. Delete 1st four the. Delete of about. Move altitude after m. Delete in. Insert

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during after altitude. Period plural. Delete times of. Remove 1st ing. L10. Delete of. Delete values. Delete the. L13. Are to were. L15. Delete ern. L17. Emission plural. Delete at. L18. Change CCN concentration to NCCN. Move flight after 2009. Delete on. L19. One flight is not much evidence. L20. Delete the. Aerosols singular.

Section 4.1. The term “particle formation” often/usually refers to elusive natural processes. This is certainly not the case in the very polluted air masses of eastern Asia. Gas to particle production in polluted air is not so profound. Did this involve clouds?

L24. Delete the.

P17, L4. Change require to have. S to Sc. Delete to activate as CCN. L5. Is to are. L6. Change “activate at the given S of” to “have Sc of.” L9. For to to. Remove ing from regarding. Delete a. Event plural. L12. Delete 1st the. L14. Is to was (twice). Delete a. Event plural. L17. Move research flight after 2009. Delete on. L18. Insert the after of. L19. Insert that after event. L20. Delete 1st ing. L22. The to this. Delete duration. Change It to This. Insert a before very. L23. Delete on this. L25. Delete is. Change 1st the to a. L27. By to of. Delete who reported.

P18, L1. Insert a after such. Delete the. L7. Delete been. Farther to further. Out to toward. L8. Yum et al., 2007 not listed in references. L10. Is to was. Delete is. L11. Taking to took. Delete across. L12. In to On. Is to was. L15. Event plural. L20. Delete the. L21. Insert for before near. Delete the. L22. Insert is before not. Delete 2nd and 3rd the. L23. Delete are combined together. L25. Measurement plural. L26. Delete the. Were to are.

P19, L1 semicolon after range. L4. Level plural and move after concentrations. Delete of. Concentrations singular. Correspond plural. Delete the. Conditions plural and move after continental. Delete of. L6. Delete away. Delete the. The ones to those. Delete the. L6-7. Delete on the. Islands singular and move in front of sites. L9. The ones to those. L11. Delete the. Retrieval plural. L12. Delete the. L13. Those to NCN. Delete about. L14. Delete or. Delete than. Move more after two. Insert or before more. L15.

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Change the ones to N0.6%. L16. Quiet to quite. L17. Change the ones to N0.6%. L19. Delete has its. Add ate to origin. An after Such. L26. Result plural. Illustrates singular. Delete the 4 times. Change minimum occurs in to lowest during.

P20, L6. Delete originated. L7. Delete the. Delete measurement. L15. Delete indeed. Change last the to this. L18. Change and to with. L19. Long to of. L20. Concentration plural. L23. Delete highly. L24. Delete 1st the. L27. Delete 1st the. In to on.

Table 1 is unnecessary. Table 2. delete number of. Table 3. delete number of. Fig. 1. Some month indication is necessary. Indicates singular. Fig. 4. Months need only be shown under panel c. Move panels closer together. Fig. 5. Hours need only be displayed below panel b; move panels closer together. Note here or in text that this is local standard time and that daylight saving time was not observed in Korea, if that is the case. Fig. 6. Hours need only be displayed below panel b. Need panel letters. at to in. Is this for all seasons? Fig. 7. Remove abscissa labels and titles from a and b. make same ordinate scales for a and b and for c and d. Remove ordinate labels and titles from b and d. Fig. 9. Same comments as Fig. 7. Same ordinate scales. Fig. 10. Were taken to took. Show airport location. Fig. 11. Remove abscissa labels and titles from a, b and c. Remove ordinate labels from b, c, e and f. Remove above abscissa labels from d, e and f. Brown looks more red. Move panels closer together. Fig. 12. Remove ordinate labels from b and c. Fig. 13. Cannot distinguish symbols. Reverse to inverted. Are these dashed lines regressions? Fig. 14. Note longitude and latitude. As recommended for previous figures remove redundant labels and move panels closer together. Fig. 17. What are the two symbols?

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