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Interactive comment on “Bounce behavior of freshly nucleated biogenic secondary organic aerosol particles” by A. Virtanen et al.

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We thank the referee for the thoughtful comments. We have improved the manuscript according to them. Below are the specific answers to the points raised up by the referee. We would also like to refer to our earlier preliminary comment for the reviewer.

Most importantly, the referee brought out the need for the reference measurements and impactor model to exclude the possibility that the small particle size itself causes the decrease of the bounce factor. We have performed the comparison measurements with solid ammonium sulphate particles in the sub 30 nm size range as well as the estimation of the kinetic energy of the impaction for 20 nm and 40 nm particles and added the analysis in to the manuscript. In the light of the new results, we can more strongly conclude that the decrease in bounce with decreasing particle size in sub 40

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nm size range is due to the changes in the solidity of the particles. We think that this improvement, driven by the comments of the both referees, strengthens the manuscript considerably.

Ref: “The experiments 1 and 2 summarized in Table 1 seem to be the same as experiments a and 2 of Virtanen et al. (2010) summarized in table S1” -Yes, this is the case. We have now pointed this in the text more clearly.

Ref: “Fig 1 of the present paper presents the same results as Fig. S1 of Virtanen et al. (2010). . . For the present study, a comparison of SMPS and ELPI current results for a size distribution peaking at 30 nm or lower would be more conducive” - Unfortunately we don't have the ELPI data measured for porous substrates in the sub 30 nm size range. But we agree with the referee that the fig. 1 is somewhat unnecessary. Thus we have removed the fig. 1.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 9313, 2011.

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