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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Size-dependent aerosol deposition velocities during BEARPEX'07" *by* R. J. Vong et al.

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Response to interactive comment by Anonymous Referee #1 on "Size-dependent aerosol deposition velocities during BEARPEX'07" by R.J. Vong et al. ACPD 10, 4649-4672, 2010.

This reviewer has suggested "relatively minor revisions" to the manuscript. (Please note that the section numbers used in the review probably refer to an earlier version of the manuscript). We will use the reviewer's stated section numbers "in quotes" for clarity in the responses while noting that the currently posted manuscript reflects changes that were requested out of the initial round of 'short reviews' and therefore may differ in certain cases. We thank the reviewer for the typographical and other errors that were caught; all of these will be fixed in the final version of the manuscript but are not

generally discussed here .

ACPD Review page # p. C236, para.2, line 6-7: We will add a statement to the effect that this site was chosen for the relatively uniform upwind fetch and available experimental infrastructure (see below).

p. C237, line 1-4: We agree with the reviewer that adding a statement to the effect that the "study addresses key factors relating to the uncertainties in using the EC technique" early in the introduction is an improvement. "Why is (deposition) important at the chosen site ?" The Blodgett Forest site is representative of a large forested area of the western U.S. and has relatively uniform upwind terrain (fetch) compared to other forested sites with available electrical power. Few data exist for EC aerosol fluxes for the accumulation mode to tall vegetation; the contrast with our previous EFLAT grass site allowed similarities and differences to be identified such as the saturation ratio flux, slope of the size distribution, and aerosol hygroscopic properties. Other BEARPEX investigators operated simultaneously with us and subsequent work may follow to tie their gas phase concentration and flux measurements to our aerosol data.

p. C237 "Section 3.1": The air flow during daytime periods that were analyzed for Vd was steadily towards the generator such that little influence would have occurred. Other measures of generator influence (e.g., ultrafine particles measured subsequently) are consistent with little or no generator influence during this steady upslope flow. The QA/QC procedures remove non-stationary periods associated with advection and/or flow through the tower (from this direction).

p. C237, "Section 4.6, para 2": We are revising the wording to reflect the range in values for gamma including adding "between 0 and 0.14 for 95% of the measurements". Note that in the figure we have chosen to plot the exponent in eq.1 (-gamma); the text will now be changed to also refer to the exponent rather than gamma.

p. C237, "Section 4.6, para 3": Lunden et al. do not present hygroscopic growth and thus are not directly applicable here. Cahill et al., JGR 111, D16312, 2006) collected

'highvol' filter aerosol samples at the same site but are not particularly useful here nor directly comparable to our BEARPEX data.

p. C237, "Section 4.6 para 5": The caption to Figure 5 will be changed to note that negative w'S' values are "downward" and that most negative values represent daytime sampling. The last line in the text here will be clarified by adding "upward" and "downward" to describe night and daytime values of w'S'. Figure 5 presents both daytime and nighttime values.

p. C238 "Conclusion": The section numbers have changed after the "short reviews" and they ought to be correct now in the posted version. Other papers in the BEARPEX special issue of ACPD detail many gas phase measurements that were performed. For the purposes of aerosol deposition our paper has attempted to present the relevant, best available, data from 2007.

p. C238 , "Figure 1": All times are standard local (Pacific) time PST. This will be noted in the Figure caption.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 4649, 2010.