Review of
The effect of hygroscopicity on sea-spray aerosol fluxes: a comparison of high-rate and bulk corrections methods.
Submitted to AMTD by
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This paper describes an analysis of humidity corrections for measurement of aerosol covariance fluxes. The approach is to correct each aerosol number count as a function of size bins at full (10 Hz) time resolution, then correlate with fast velocity. The approach is compared to two earlier papers (F84 and K01) that post-correct the aerosol-vertical velocity covariance based on mean humidity saturation flux. The authors refer to these previous works as bulk methods.

Good Points.
*The introduction is nicely written and comprehensive.
*The descriptions of the bulk methods are clear but reasonably brief.
*The authors have a nice data set to do this evaluation.
*Different aspects of the corrections are exmined in detail and many issues are considered – a very thorough job.
*Conclusion section is tight and a good summary.

Not so good points.
*I was unable to convince myself I understand exactly what they did for fast processing. I read section 2.2 several times and am still somewhat puzzled. Perhaps the authors could make this section more reader-friendly.
*Figs. 10 and 12 show scatterplots comparing estimates of the deposition velocity error associated with humidity effects for bulk vs fast methods. Looking at Fig. 12, there are some clear major differences as a function of size. Channel 5 has high correlation but a large offset. Channel 3 has two groupings of points and Channel 9 has poor correlation. I don't find any significant discussion in the paper and I can't see how 1.8 micron particles can behave so differently from 1.5 and 2.2 micron particles.

On balance this is a good paper and is acceptable for publication with minor revisions.

Here are a few other comments to consider.

P6288, Line 7. I don't think it is correct to characterize the covariance as the 'net aerosol flux (production – deposition)' . I believe the net flux is $\overline{w'n'} - V_g \bar{n}$ and that is equal to effective production - deposition.

P6291, Eq (6). A more accurate formula is

$$\overline{w'S'} = \frac{c_e}{c_d^{1/2}} u_* (1-S)[1 + \frac{L_e}{RT^2}(Ts - Ta)]$$

It might be amusing to test this one.

P6296. Fits to aerosol spectra are generally done in log-log space. I don't think it adds much to include the linear-linear fit.

P6300, line 10. Can you not get negative DVd if Beta is negative?

Fig. 6 mostly just shows the importance of getting the aerosol slope correct. That seems mathematically obvious. Could just state the errors associated with it and skip the figure.

Several figure panels (8,13, 14) are poorly scaled and just show spikes. This could be improved.