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Atmospheric Measurement Techniques Discussions

Interactive comment on "Evaluating the capabilities and uncertainties of droplet measurements for the fog droplet spectrometer (FM-100)" *by* J. K. Spiegel et al.

Anonymous Referee #1

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A very thorough analysis is presented about the performance of the FM100 fog droplet spectrometer for ground-based field experiments. Errors resulting from the non-monotonic Mie-scatter curve and from losses at the inlet (non-isoaxial and non-isokinetic effects) are analyzed, recommendations for the future operation of the instrument are provided. Overall, the paper is well written, informative, and in a very good shape.

A few questions and suggestions should be addressed here:

In general, it would have been nice to see that the manufacturer of the instrument to

contribute to the manuscript more substantially than just through personal communication. Probably, a few questions could have been addressed in more detail (some of them addressed below). There may be a good reason for this procedure, which is however not indicated.

How is the instrument calibrated eventually? Is a theoretical computation, or is it a lab calibration? If the latter is the case, do glass beads scatter the light in exactly the same way as water droplets do? How is the Mie scattering of droplets that are non-spherical during their travel through the instrument? What is their travel velocity?

It would be nice to see the basis of Mie scattering calculation. The curve (Fig. 3) applies for the 658 nm laser light. How large would the difference be for other wavelengths? See also p 3357 l 20/21.

p 3340 l 17-18: "fairly undisturbed": It seems that there are limitations caused by the massive building on top of the mountain. Aren't there any concerns about potential disequilibrium effects through flow distortion? Where was the PVM positioned? Is it feasible to assume that two instruments, located at some distance from each other under these conditions, yield the identical LWC?

section 3.1.2: For which time integration period was this procedure applied?

p 3359 l 3/4: the sentence is incomplete. Add "be" after "longer".

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 3333, 2012.