Atmos. Meas. Tech. Discuss., 6, C1952–C1953, 2013
www.atmos-meas-tech-discuss.net/6/C1952/2013/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Characterization of an aerodynamic lens for transmitting particles >1 micrometer in diameter into the Aerodyne aerosol mass spectrometer" *by* L. R. Williams et al.

Anonymous Referee #3

Received and published: 8 August 2013

Paper Summary: This paper by Williams et al. introduces a new aerodynamic lens system which successfully transmits particles larger than 1 micron. The characterization of the lens, and comparison with other aerodynamic lens designs is clearly explained. I suggest publication of this paper in AMT after the following general comment, and specific comments have been addressed.

General Comment: With the higher pressure in the lens, how does that affect the flow regime, and the subsequent effective diameter classification. For a 100nm particle, the Knudsen number is still in the "free-molecular" regime, however, at 1 micron, the particles start to be in the transition regime between free-molecular and continuum flow.

Does this change introduce errors or other assumptions into size calibration functions, and diameter comparisons with other instruments?

Specific Comments: (Smaller comments on grammar or easily fixable content) 5035-3: In this context does diameter refer to the aerodynamic diameter or the physical diameter of the particles?

5035-18: References for aerodynamic lens should be introduced here (they are referenced on the next page).

5036-10: "too well" is awkward. Suggest rewording or eliminating.

5043-10: Could the authors clarify this. If the particles were size selected with a DMA, then presumably they were already charged prior to introduction into the SMPS. Were the particles "re-neutralized" prior to passing through the SMPS? This is not clear.

5045-5: I suggest replacing "and" with "therefore particle. . ."

5045-9/15: This section on beam spreading is confusing to the reader. "Es" should be introduced earlier in this part. Additionally, the "similar lens in Liu et al." phrase could be reworded to more explicitly state that a "standard" lens showed a 10% effect at particle sizes around 40 nm.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 5033, 2013.