

## ***Interactive comment on “Results and recommendations from an intercomparison of six Hygroscopicity-TDMA systems” by A. Massling et al.***

**Anonymous Referee #2**

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Hygroscopicity Tandem Differential Mobility Analyzers have in the past years become very popular instruments, both in the lab and in the field, for determining water uptake of aerosol particles at a given relative humidity. This is a very useful paper as it gives recommendations for construction of reliable HTDMA-instruments. I recommend acceptance in AMT, and have only three comments that I think the authors should address first.

1. As I understand it, in at least one of the HTDMA instruments (Haemeri et al, 2000) the RH of the aerosol flow is kept 3% lower than the RH of the sheath air. As shown by Biskos et al. (ACP 6, 4633), this can affect the GF measurement especially with small

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particles. If indeed the aerosol flow RH was lower, then its effects on the results should be discussed. If the aerosol and sheath flows had equal RH, it should be mentioned.

2. Theoretically, there is a size effect to the DRH, which should be noticeable at least with the 30 nm particles, see e.g. Topping et al. (ACP 5, 1205). On the other hand, Biskos et al. didn't observe such an effect with ammonium sulfate nanoparticles (within the uncertainty of their RH measurement of 2.5%). Nevertheless, I believe that this issue should be at least mentioned.

3. System 1 shows the largest positive difference in RH from setpoint (Fig. 3) and a corresponding positive difference in DRH (Fig. 6). However, system 2 shows a large negative difference in RH from setpoint but a positive difference in DRH. This seems strange, and should be discussed.

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