

In this study, Zhang et al. developed a humidity-controlled fast integrated mobility spectrometer (HFIMS) for fast measurements of aerosol hygroscopic growth. Based on their previous work, a dual-channel humidifier and an optimized measurements sequence for different size particles were employed to achieve fast measurements. Compared to the H-TDMA techniques, the measurements time needed for a complete RH range cycle (20~85%) were largely shortened for the HFIMS, demonstrating its good feasibility in hygroscopic growth measurements for size-resolved ambient aerosols under different RHs. The manuscript is well written and easy to follow, I have several minor suggestions for authors' consideration.

Line 35: should be "an HTDMA".

Line 76: Please clarify the residence time of aerosols in the humidification section.

Line 95-96: Please clarify how to control the WFIMS sheath flow rate. A proportional solenoid valve coupled to a PID controller used here?

Section 2.2: RH in both aerosol and sheath flow was rather sensitive to the temperature fluctuation, please state how to maintain the stability of temperature during measurements.

Line 159-160: An optimized measuring sequence was introduced for six particle sizes; however, have the authors evaluated the effect of multi-charge on particle size determination, due to a large proportion of multi-charge particles (especially for 100-300 nm) selected by differential mobility analyzer (Shen et al., 2021, <https://amt.copernicus.org/articles/14/1293/2021/>)?

Line 212-214: Have the ambient aerosols been dried before measurement by a SMPS?

Section 3.2.2: I would like to draw the authors' attention to a recent review paper on the tropospheric aerosol hygroscopicity in China (Peng et al., 2020). It may be beneficial for the authors to discuss the RH and size dependence of ambient aerosol hygroscopicity. (<https://acp.copernicus.org/articles/20/13877/2020/>)

Line 269-270: Please add references to support this claim.