

## ***Interactive comment on “Winter time hygroscopicity and volatility of ambient urban aerosol particles” by Joonas Enroth et al.***

**Anonymous Referee #3**

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Enroth et al. reported the hygroscopic and volatile properties of atmospheric aerosol particles with varying dry diameters by using a VH-TDMA system in central Budapest during two months in winter. The urban particles showed distinct bimodality with respect to both hygroscopic and volatile properties, which were significantly influenced by vehicular road traffic. While this paper uses sound techniques and is generally well written, substantial revisions especially for the discussion section are needed before this manuscript can be considered for publication in ACP. Major comment: The authors did not discuss their data and results adequately within the framework of current knowledge in the literature. Thus, it is not clear to the readers how atmospherically important of this work is and what new information it has offered. The authors could expand the discussion section by framing the results in this study into the existing

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literature to highlight the contribution to scientific progress. In addition to this very general comment, several specific comments and some requested clarifications are outlined below. Specific comment: P1 L7: “atmospheric aerosol particles” should be “atmospheric particles” or “aerosol particles”. P1 L12: “it was decreasing monotonically from 71% to 41% with particle diameter.” With INCREASING OR DECREASING particle diameter? It should be expressed accurately. The corresponding modifications should be made throughout the whole manuscript. For example, P1 L17 and P1 L19. P1 L28-31: The last sentence in the abstract is rather tedious. It should be rephrased to make it clear. I suggest the authors check throughout the manuscript as there are a few other cumbersome statements. P2 L9-12: The sentence should be rephrased or broken into two. P2 L26-27: As is listed, there are many references on the measurements on complex urban aerosols. Why the authors stated that corresponding measurements are so scarce? P2 L29: This sentence should be rephrased to make it clear. P3 L17: “using a silica-gel diffusion dried at indoor temperatures”. “dried” should be deleted. P3 L29: This temperature was selected by considering previous experience. The authors should clarify how the temperature was selected based on previous experience. P5 L3: It is not clear which surface tension value ( $\sigma = 72 \text{ mN m}^{-1}$  or  $60 \text{ mN m}^{-1}$ ) was used in the calculations. Please clarify it in the manuscript. P5 L6: Please clarify the experimental uncertainties in detail. P5 L28: What is the size range for UF particles? P6 L1: The contribution of the two modes was size dependent. It is not clear how it can be concluded from Fig.1 as only data for particles with a dry diameter of 145 nm was given.

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2017-926/acp-2017-926-RC1-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-926>, 2017.

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