

Interactive comment on “Interpretation of Particle Number Size Distributions Measured across an Urban Area during the FASTER Campaign” by Roy M. Harrison et al.

Anonymous Referee #2

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The paper deals with a 1-month long campaign dedicated to ultrafine particles in urban environment in London. The measurements were realized in winter 2017 at 5 sites using appropriate instrumentation including SMPS and CPC among others. The work presented here has an important contribution to the urban characteristics and features of UF particles. The paper is well written, uses adequate scientific methods, and has important conclusions. Therefore, I recommend the publication in ACP after considering the following minor comments.

General comments:

1. L131: "The instruments (Table 1) were operated according to Wiedensohler et al.

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(2012) guidelines and calibrated and intercompared both before and after the sampling campaign." There is a contradiction since dryer was not used at 3 sites and therefore how could you keep the RH below 40% as it is written in the cited paper? Also some additional data on the intercomparison would be advantageous since different type of CPCs were used, and the manufacturer provides 10% uncertainty between identical CPCs?

2. The work and measurements were dedicated to ultrafine particles, and nucleation mode was extensively examined in the paper. However, there is no clear evidence of atmospheric nucleation and subsequent growth in the paper. Could you provide some info regarding this?
3. In the Introduction section there are only Harrison co-authored papers cited except the authoritative reviews that altogether seems to be inadequate. Please take a deeper overview.
4. Please indicate the numbers of observations per wind sector since the representativity is not evident.
5. The street canyon wind flow diagram is highly appreciated.
6. Have you considered using median size distributions instead of average? Or is there any specific reason doing this way?

Technical comments:

L95: "Data recovery was high at all sites": Please quantify it or at least reformulate the sentence. The CPC and SMPS size ranges should be added to the Table 1 as well.

L339: Remove value judgement: "Perhaps surprisingly"

L346: "the ratio of CPC to SMPS is typically around two": Why is it typical? Please clarify it.

L457: Could that be related to other emission sources e.g. residential heating due to

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its uniformity or other (meteorological) processes?

L542: Remove value judgement: "surprisingly"

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