

## ***Interactive comment on “Observation of new particle formation in subtropical urban environment” by H. C. Cheung et al.***

**Anonymous Referee #4**

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### General comments

The manuscript submitted by Cheung et al. reports on particle size distributions measured during a year-long campaign in Brisbane, Australia. New particle formation and nucleation events are an important topic in aerosol research where many open questions remain. However, as was already discussed by the other reviewers, the present data set and its analysis as presented right now do not add significant contribution to answering the open questions remaining. Missing meteorological and precursor gas data cannot be added anymore and hence it will be difficult to tackle the interpretation of data in terms of chemical processes which are very important when trying to understand nucleation. Nevertheless, with some more work on the analysis and especially the interpretation of the data (with more focus on interpretation than just on description

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of observations) and after addressing the points also mentioned by the other referees I support publication of the present manuscript.

### Specific comments

1. Section 2.1, first paragraph: The description of the first sector of the economic activity in Brisbane is not important for this study and could be left out.
2. Section 2.3, first line: Give full word for UFPs (instead of in the second paragraph of that section). Exact dates for the measurement period should be given, not just the months.
3. Section 2.4: More information should be given on the data analysis. Were the size distributions corrected for multiply charged particles? The criteria set for deleting data should be explained in more detail. How big was the percentage of data which had to be removed?
4. Section 3.2.1: The relationship of particle number concentrations and RH and its implications for atmospheric processes is not sufficiently discussed
5. Figure 6: It would be more meaningful if the wind direction data could be plotted in a polar graph
6. Figure 7: Discuss in more detail the shape of the UFP and nucleation mode curves, e.g. why is there a peak around 4 ms<sup>-1</sup>?
7. Section 3.3.2: Can you give more information on the seasonal variation of nucleation events, especially on the fact that only very few or none can be observed during November/December? Discuss in more detail the relationship of solar radiation and nucleation events/growth rates, especially in terms of photochemical processing of precursor gases.
8. Conclusions: The lack of nucleation events for maritime air masses is mentioned. But NE winds bring air masses from the port and hence the coast. Please elaborate

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further.

#### Technical comments

1. Revise the use of plural and singular (in verbs versus nouns) throughout the whole manuscript
2. Revise use of passive versus active verb forms throughout the whole manuscript (e.g. "contributes to" instead of "was contributed to" in the abstract)
3. Revise use of prepositions and articles throughout the article (e.g first sentence of abstract)

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 22623, 2010.