

## ***Interactive comment on “Aerosol particle size distributions in the lower Fraser Valley: evidence for particle nucleation and growth” by M. Mozurkewich et al.***

**M. Mozurkewich et al.**

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We thank the referees for their constructive comments. We have altered the text as follows. We have also corrected a few typographical errors.

### **Referee #1:**

1. The abstract and conclusions have been modified to make it clear that we can only conclude that the particle growth, but not the nucleation, is driven by organic compounds.
2. We have tried to clarify the direction of airflow discussed on page 1636.
3. Some more details about local sources have been added to the first paragraph of the experimental section.

4. Some more details about the calculation of the organic fraction have been added in the experimental section. A full description is given in the previous paper that is cited.

5. We have changed the label on Figure 6 to make it clear that the quantity presented is the organic volume fraction.

We have made the suggested technical corrections.

### Referee #2:

1. The referee is correct that there is some evidence for nucleation on these days. But it is far from conclusive. Especially on August 15 (Figure 3), the relatively higher particle concentrations below 20 nm may have been due to a lesser degree of coagulation of the freshly emitted particles. Considering the high particle concentrations on this day, nucleation would be surprising. And it is difficult to see how nucleation could be contributing significantly to the sustained population of these particles when the CPC data indicate that there were few particles below the lower size limit of the DMA. Of course, we can not completely rule out the possibility that some nucleation was occurring, but we think it likely that it was at most a minor process.

For August 30 (Figure 9) the probability of nucleation is greater. We have modified the text in this section to acknowledge this possibility.

2. We have modified the text to use the terms nucleation, Aitken, and accumulation for the various modes as much as we think is appropriate. There are some exceptions. For example, we avoid the term "nucleation mode" as a description of a size range; we use it only for particles that appear to have been formed by recent nucleation. We continue to refer to emission and growth modes for the distributions on the afternoon of August 15 since both modes fall within the Aitken mode size range. We use the term "ultrafine particles" for particles with diameters below about 40 nm whether in the nucleation or Aitken modes; our use of this term is now defined in the introduction. The wording on page 1636 was confusing and has been changed.

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3. The entry 'NO<sub>x</sub> X 10' did not belong in the legends for Figures 4 and 9. This has been corrected. The values should be divided by 10. They are indeed rather high.

The suggested technical corrections have been made.

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 1623, 2004.

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