

## ***Interactive comment on “Size distribution and coating thickness of black carbon from the Canadian oil sands operations” by Yuan Cheng et al.***

### **Anonymous Referee #1**

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In this study the authors present results from aircraft measurement on BC in the Canada oil sand region. The BC size distribution was investigated by calculating particle size from the measured mass concentration and density using SP2 instrument. The BC concentration and size distribution in and out-of-plume in the OC region and downwind area were studied and compared. The number and mass size distribution did not show significant temporal differences. Some interesting and valuable information was obtained from this BC study on the OS region. The manuscript is well-organized and clearly presented. I'd like to suggest the acceptance of this manuscript after a minor revision.

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Line 169- is the width of “0.7” that geometric standard deviation, or coefficient of variation?

Lines 174-184, it would be better for readability and easy in a comparison if this information can be present in a table or well-designed figure.

Lines 190-191, BC mass, or number concentration distribution?

Line 203, suggest to rephrase as “including results from the present study”

Line 203, any suggestion on the variation of this 60 nm proposed?

Line 222-223, suggest to revise as “mean negligible difference in the size distribution between the in- and out-of-plume over the OS region”.

Line 230-232, the information on other measurements during the flight may be necessary to be mentioned in the Method section.

Lines 300-305, source types, species present in the ambient air, and the degree of aging are all factors can significantly affect the change of BC size distribution.

Line 338, Figure S2 or Table S2?

Figure 1- is it possible to place a real map in this figure?

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