

## ***Interactive comment on “An Evaluation of three methods for measuring black carbon at Alert, Canada” by Sangeeta Sharma et al.***

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This evaluation of three measurement techniques at a remote monitoring site provides a useful, quantitative comparison of three, distinctly different approaches for deriving mass concentrations of black carbon. The paper is well organized and addresses the uncertainties and limitations of the three techniques that yield EBC, EC and rBC.

I have few questions, comments or concerns. Those that I do have are listed below; however, I would offer the authors one suggestion that might provide additional insight into the variations that are seen in the MAC and differences between EBC and EC. Given that multi-wavelength sensors were implemented, the Angstrom Absorption Exponent (AAE) can be derived that has been shown to be sensitive to the source of

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combustion that produces the BC. Perhaps the AAE could be calculated and drawn on Fig. 5d along with the values of EBC, EC and rBC, or related to the MAC and rBC coating to link these variations to the combustion type?

#### Additional comments

Page 6, Line 7: "There are no other scattering or absorption corrections...". I don't understand why corrections are not being applied when further on, the PSAP is corrected.

Page 6, line 28: How were PSAP measurements converted from 530nm to 550 nm?

Section 2.4: The uncertainty estimates should be added in Table I.

Section 4.1.4: Should explain why EBC is not used in the best estimate of BC.

Page 21, Supplement figure. The caption refers to green "stars" that are actually diamonds. In the text they are referred to correctly.

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