

Interactive comment on “Optical properties and molecular compositions of water-soluble and water-insoluble brown carbon (BrC) aerosols in Northwest China” by Jianjun Li et al.

Anonymous Referee #3

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In this work, the authors examined the absorption properties and molecular compositions of water-soluble and –insoluble PM_{2.5} brown carbon from a rural site in China. Seasonal variation, day time vs night time, as well as water-soluble vs water-insoluble of absorbance and MAC values of particles were discussed. Their results showed the contribution of photochemical formation of Brown carbon and Biomass burning emissions to higher daytime MACs in summer in the region. They also suggest the important role of aqueous-phase reactions and nitrated aromatic compounds in the formation of secondary brown carbon. Overall, the authors have done a great job in analyzing and discussing their data. The work is also well presented. I recommend acceptance. Below are some minor comments.

C1

- 1) Line 120 should it be “~8am to 8pm”?
- 2) Section 2.4 please indicate where to subtract the signal from blanks in your calculations.
- 3) Line 170 what is M in Eq. 3?
- 4) Line 222 “Abs₃₆₅ of WS-BrC is significantly higher than WI-BrC in summer, but values are comparable in winter”. However, Figure 2 shows Abs₃₆₅ of WI-BrC is higher than WS-BrC in winter. Please explain.
- 5) Line 405 an increase of MAC₃₆₅ during New Year’s Eve was observed but an increase of Abs₃₆₅ or PM mass or WSOC was NOT observed. Please explain.

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