Reply to Reviewer #2

The authors have addressed most of my comments, except please make one more clarification before publication.
The text states: It is stressed that the results in the present work only represent the direct radiative effects of water-soluble fractions of BrC, while the estimated effects should be less than the actual effects of aerosol BrC since the water-insoluble species in BrC were not considered in the calculation.
Please add to this (if the authors agree) something like. In addition, the predicted radiative effects are for BrC measured in the extract and does not include changes in BrC light absorption if the BrC was in actual aerosol particles.
The point here is that I believe there are two issue that should be discussed, one that you only consider water-soluble species, and two, no attempt to convert bulk (extract solution) BrC to aerosol particle BrC. See Zeng et al for more details or references there-in.

Reply: We fully agree with you that light absorption properties of solvent extracted BrC and particle phase BrC are different. Previous studies have found the discrepancies between BrC light-absorption of particle- and extracted- BrC (Liu et al., 2013; Cheng et al., 2021; Zeng et al., 2022). Here, we add the clarification according to your suggestion in the revised manuscript. The corresponding references are also cited.

"It is stressed that the estimated effects in the present work only represent the direct radiative effects of water-soluble fractions of BrC, while the water-insoluble species in BrC were not considered in the calculation. Besides, these predicted radiative effects are for water-soluble BrC measured in the extract and do not represent the actual effects of atmospheric BrC aerosols. The discrepancies between BrC light-absorption of particle-phase BrC and extracted-BrC have been found in previous studies (Liu et al., 2013; Cheng et al., 2021; Zeng et al., 2022) and will not discussed here." (see Page 10, Lines 268-272)

References:
Liu, J., Bergin, M., Guo, H., King, L., Kotra, N., Edgerton, E., and Weber, R. J.: Size-resolved measurements of brown carbon in water and methanol extracts and estimates of their contribution to ambient fine-particle light absorption, Atmos. Chem. Phys., 13, 12389–12404, 2013.
Cheng, Z., Atwi, K., El Hajj, O., Ijeli, I., Al Fischer, D., Smith, G., and Saleh, R.: Discrepancies between brown carbon light-absorption properties retrieved from online and offline measurements, Aerosol Sci. Technol., 55, 92–103, 2021.
Zeng, L., Dibb, J., Scheuer, E., Katich, J. M., Schwarz, J. P., Bourgeois, I., Peischl, J., Ryerson, T., Warneke, C., Perring, A. E., Diskin, G. S., DiGangi, J. P., Nowak, J. B., Moore, R. H., Wiggins, E. B., Pagonis, D., Guo, H., Campuzano-Jost, P., Jimenez, J. L., Xu, L., and Weber, R. J.: Characteristics and Evolution of Brown Carbon in Western United States Wildfires, Atmos. Chem. Phys. Discuss. [preprint], in review, 2022.