Atmos. Chem. Phys. Discuss.,
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Complex refractive indices in the ultraviolet and visible spectral region for highly absorbing non-spherical biomass burning aerosol" *by* Caroline C. Womack et al.

Anonymous Referee #2

Received and published: 2 February 2021

The manuscript by Caroline et al. presents broadband optical measurements of biomass burning aerosol and additional scattering standards. These measurements and analysis are non-trivial, but this work shows that reducing the refractive index revival uncertainty will become critical for ambient measurements and pushing for improvements in global models.

The manuscript is written clearly and added a significant contribution to the community.

Comments:

Figure 4 and related discussion: There is an additional literature line to add from: Bain, A., Rafferty, A., and Preston, T. C.: The Wavelength Dependent Complex Refractive In-

dex of Hygroscopic Aerosol Particles and Other Aqueous Media: An Effective Oscillator Model, Geophys. Res. Lett., 46(17–18), 10636–10645, doi:10.1029/2019GL084568, 2019. Note, the Bain et al. paper was for aqueous solutions, so depending on your humidity, this may not be a valid comparison.

The Bain et al. paper also should be brought into the new discussion of the Kramers-Kronig relation suggested by the other reviewer.

Figure 7 and other burns: Given you are reporting on 13 burns completed and show fit quality in Figure 7, It would be informative to add the refractive index spectra for the other burns in the supplemental information. A repeat of Figure 5a for each burn in the SI.

Line 24: The spacing is inconsistent in the reported refractive index. Also, I think 1.635 ($\pm$ 0.056) + 0.6 ($\pm$ 0.056)i would read better, but that is your choice (or typesetter's).

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1200, 2020.