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Comment on acp-2022-459

Anonymous Referee #3

Referee comment on "Examination of Brown Carbon Absorption from Wildfires in the Western U.S. During the WE-CAN Study" by Amy P. Sullivan et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-459-RC3>, 2022

This paper presents the brown carbon measurements during the WE-CAN study, from a Particle-into-Liquid Sampler with a Liquid Waveguide Capillary Cell and a Total Organic Carbon analyzer (PILS-LWCC-TOC) system, and a Photoacoustic Aerosol Absorption Spectrometer (PAS) system. They also collected a number of liquid samples through another PILS system for offline analysis. As PAS can only measure optical properties at certain wavelengths, the authors mainly compare PAS and PILS absorption at 405 nm. They find that with correction for water insoluble organics and bulk solution, PILS absorption at 405nm is in good agreement with PILS measurement at 405nm. They also find that the photobleaching is not significant within the first 9h after emission. Overall, this is a very interesting study and great addition to literature on brown carbon measured from wildfires. I recommend it to be published with minor revision. A few comments:

- For Figure 2, it is unclear why PILS Abs 365 has excellent correlation with PILS Abs 405 for research flight 02, but not so great for research flight 11? Was that because RF11 samples a lot more background air? Some explanation on the difference between these two flights would be useful. Also, it would be important to comment on this aspect for other flights.
- I kept wondering if the conclusion of no significant photobleaching within the first 9h after emission, could be a wavelength-specific problem. Can the authors add PILS Abs 365 to Figure 11? So, it would be clear whether a similar conclusion can be reached for the absorption at 365nm or even shorter wavelength.