Characteristics and Evolution of Brown Carbon in Western United States Wildfires

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Supplementary Material

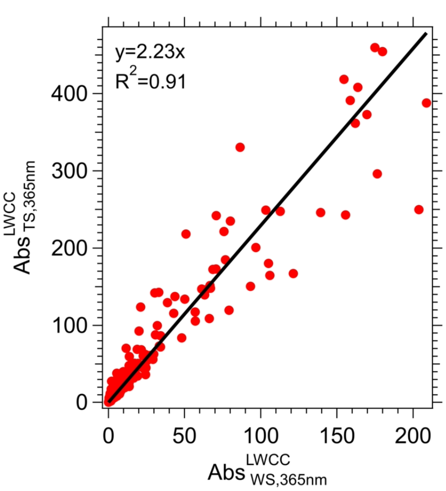


Figure S1. Comparison of TS BrC ($Abs_{TS,365nm}^{LWCC}$) and WS BrC ($Abs_{WS,365nm}^{LWCC}$) at 365 nm (total soluble=water soluble + methanol soluble) for all FIREX-AQ identified smoke plumes. The line represents the orthogonal distance regression of the data forced through zero.

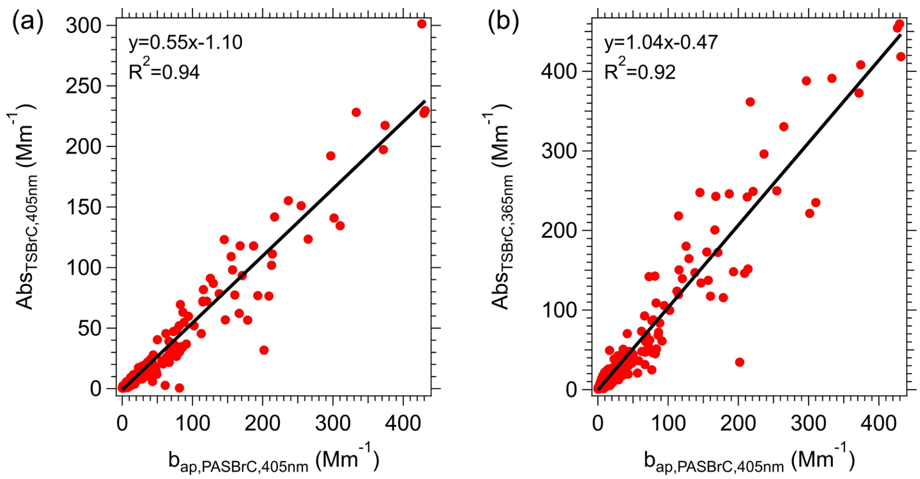


Figure S2. Comparison of BrC absorption in liquid (without applying the conversion factor K) at (a) 405 nm and at (b) 365 nm with BrC absorption inferred from the PAS at 405 nm.

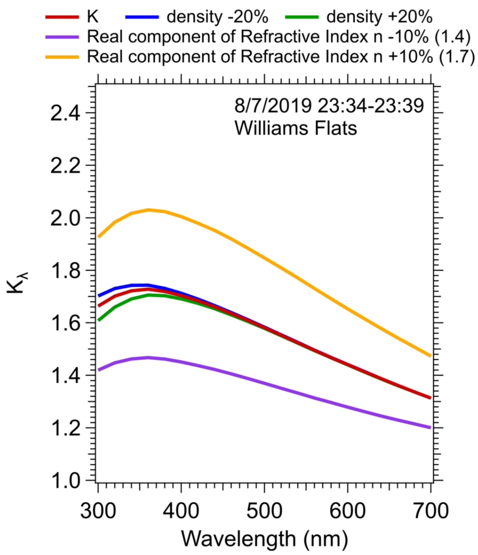
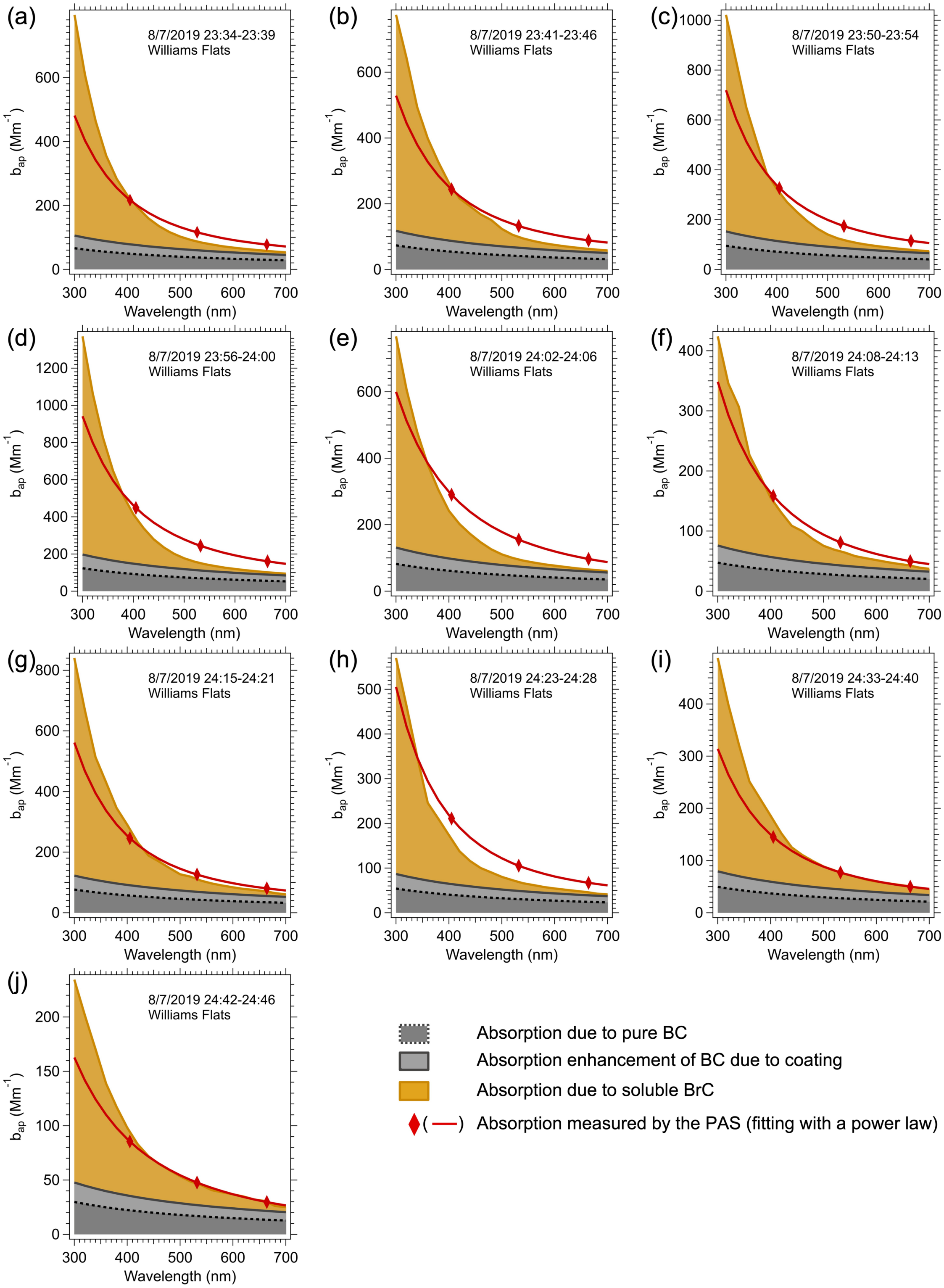


Figure S3. Sensitivity analysis of the conversion factor from absorption in liquid to aerosol based on Mie theory. The red curve, which is the same as the one in Figure 4, with assumptions that n=1.55, and density is 1.4 g cm^{-3}. Tuning the particle density by up (green) or down (blue) by 20% only results in less than 5% change. Altering the real component of the refractive index (n) by up (yellow) or down (purple) by 10% can lead to ~20% of variation.



45 Figure S4. Closure analysis of aerosol absorption measurements for the Williams Flats fire airborne measurements starting on 7 Aug. 2019. Each plot is the average of a plume transect starting from near to further from the fire. This fire had high BC concentrations relative to BrC.

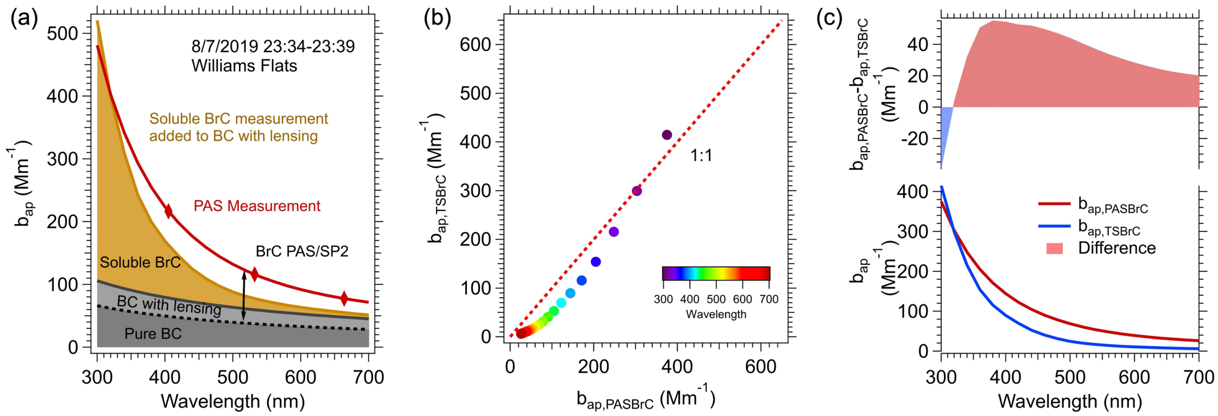


Figure S5. Similar plots shown in Figure 5, but with K=1 (without applying the conversion from liquid to aerosol).