

Evolution of Brown Carbon in Wildfire Plumes

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Figures S1 to S4

Additional Supporting Information (Files uploaded separately)

None

Introduction

The following four figures below include: (S1) More detail for the in-plume data selection procedure based on correlations between brown carbon (BrC) and carbon dioxide (CO); (S2) Identification of data points removed from analysis due to alternate fire source interference; (S3) Magnitudes of sunlight exposure times for quantitative analysis of photochemistry time scales; and (S4) Complete solution light absorbance spectra for the Rim 1 and Rim 2 plumes at a range of ages. More details can be found in the paper.

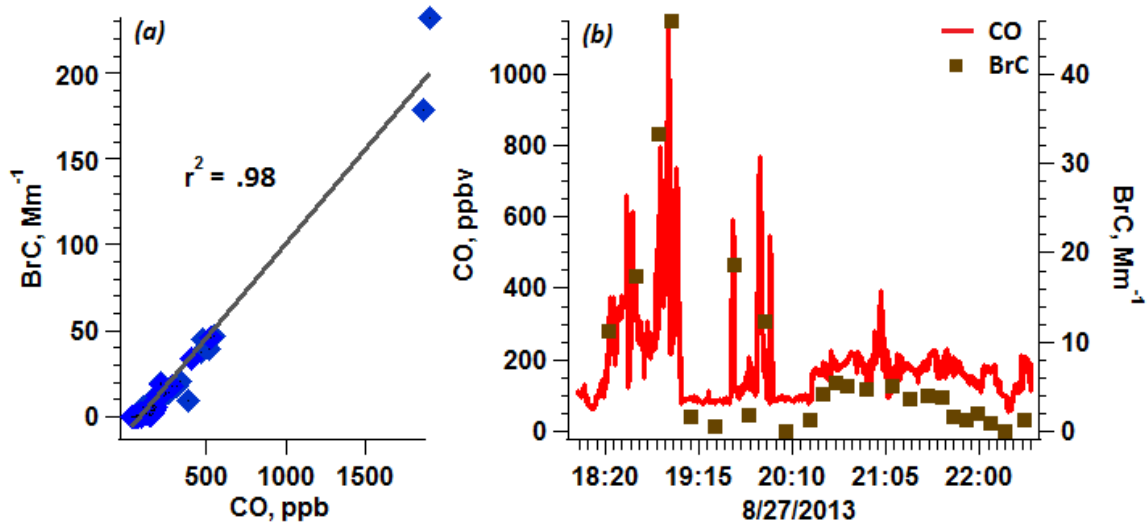


Figure S1. Co-variability in carbon dioxide (CO) and brown carbon (BrC) for Rim 2, where (a) shows the correlation between CO and BrC inside of the plume, and (b) shows how BrC measurements follow CO both in and out of the plume.

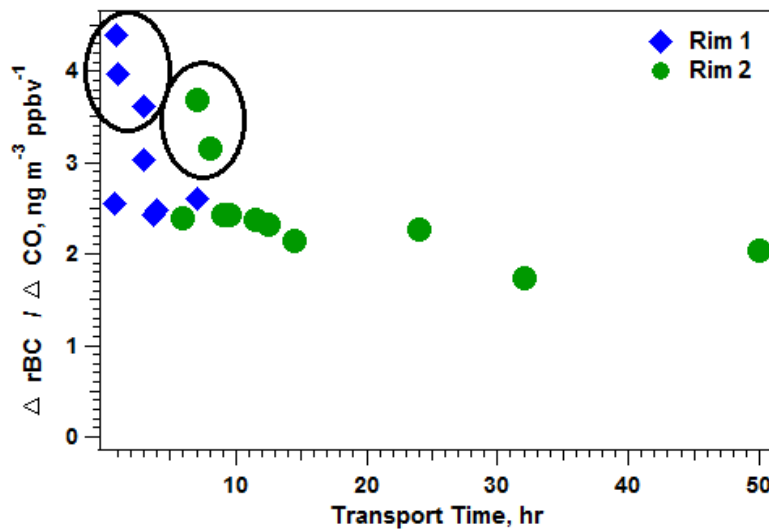


Figure S2. Evolution of refractory black carbon (rBC) in the smoke plumes observed on 26 and 27 Aug 2013; the circles indicate the points that were excluded from the Rim fire analysis due to emissions from other fires in the area, based on differing $\Delta rBC/\Delta CO$ ratios from the main plume. Transport time for Rim 2 is calculated using the Elk Creek Complex fire.

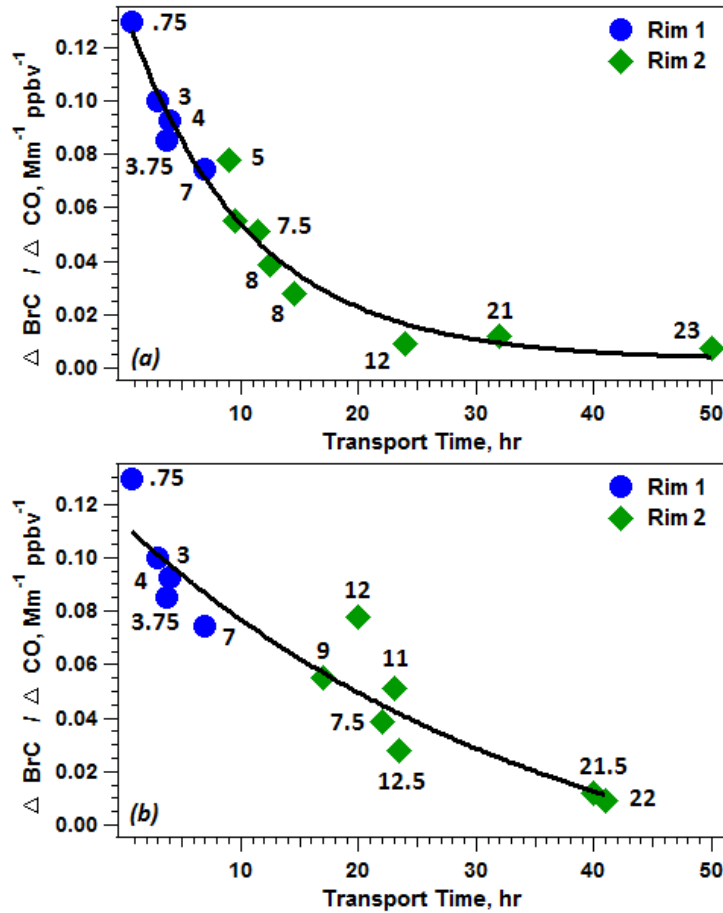


Figure S3. Evolution of brown carbon (BrC) in the Rim smoke plumes, with numbers reporting the amount of time the smoke was exposed to sunlight during transport. The line is an exponential fit indicating the loss of BrC. Transport times are calculated for Rim 2 using (a) the Elk Creek Complex fire as the source, and (b) the Yosemite fire as the source.

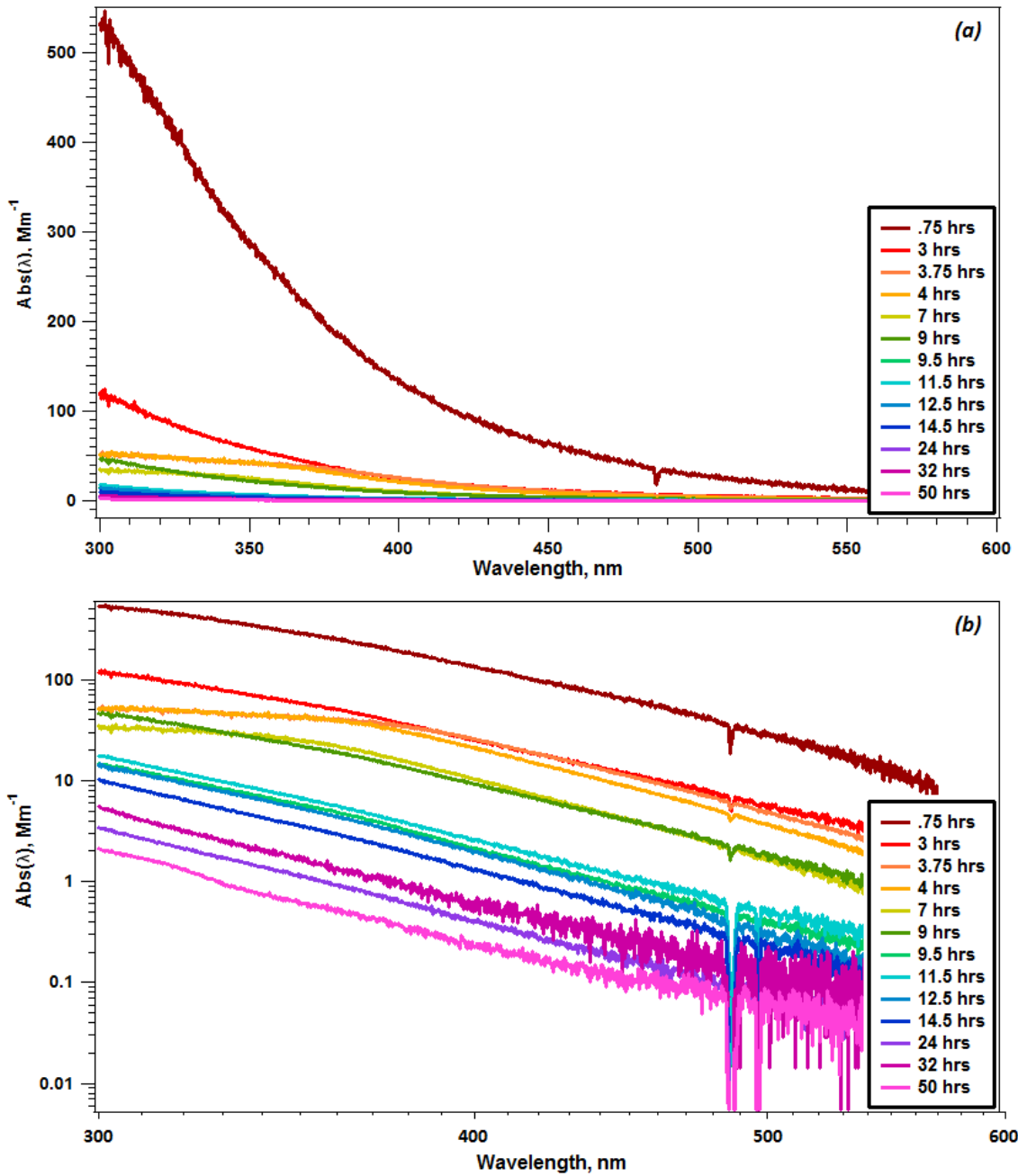


Figure S4. Light absorbance spectral profile versus plume age, where color indicates the estimated transport time.