Supplement of

Collection efficiency of the Soot-Particle Aerosol Mass Spectrometer (SP-AMS) for internally mixed particulate black carbon

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Supplementary Information

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Figure S1: Schematic of beam width probe orientation. Left: BWP orientation for particle beam width measurements, the BWP is situated perpendicular to the laser beam and is moved horizontally. Right: BWP orientation for effective laser beam width estimation, the BWP is moved vertically.
Figure S2: RIE$_{rBC}$,app (top) and RIE$_{Org}$,app (bottom) measured as a function of BES coating thickness, demonstrating an increase in sensitivity that reaches saturation at R$_{Org/RB} \sim 3$. Data are plotted against SP-AMS derived R$_{Org/RB}$ because particle mass analyzer measurements were not available during this experiment. RIE$_{Org}$,app values were obtained from SP-AMS data using measured d$_{oa}$ values and assuming that coated particles have a core-shell structure. Data from ARI SP-AMS (SN 215-039).
Figure S3: Top: The ratio of SP-AMS fraction of Regal Black ($f_{RB}$) to the particle mass analyzer $f_{RB}$ as a function of $R_{Org/RB}$. Data from ARI SP-AMS (SN 215-039 (blue) and 215-130 (red)) showing an approximately 40% underestimate in $f_{RB}$ when CE effects are not accounted for. Bottom: The fraction of Regal Black in BES coated particles ($f_{RB}$), obtained from particle mass measurements, plotted against the fraction of Regal Black obtained from SP-AMS mass loadings using uncorrected $RIE_{rBC}$ (0.2) and $RIE_{Org}$ (1.4).