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Supplement of

Collection efficiency of the soot-particle aerosol mass spectrometer (SP-AMS) for internally mixed particulate black carbon

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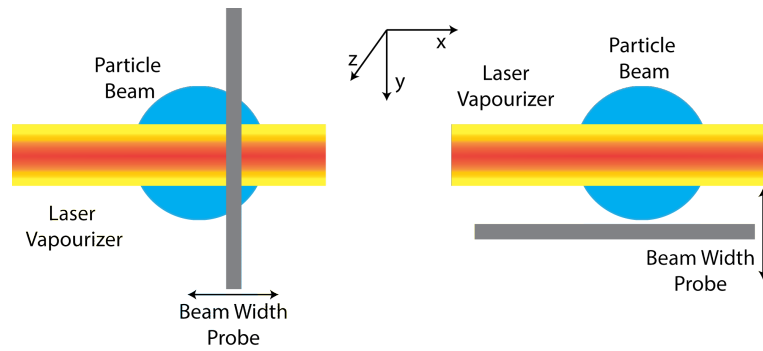


Figure S1: Schematic of beam width probe orientation. Left: BWP orientation for particle beam width measurements, the BWP is situated perpendicular to the laser beam and is moved horizontally. Right: BWP orientation for effective laser beam width estimation, the BWP is moved vertically.

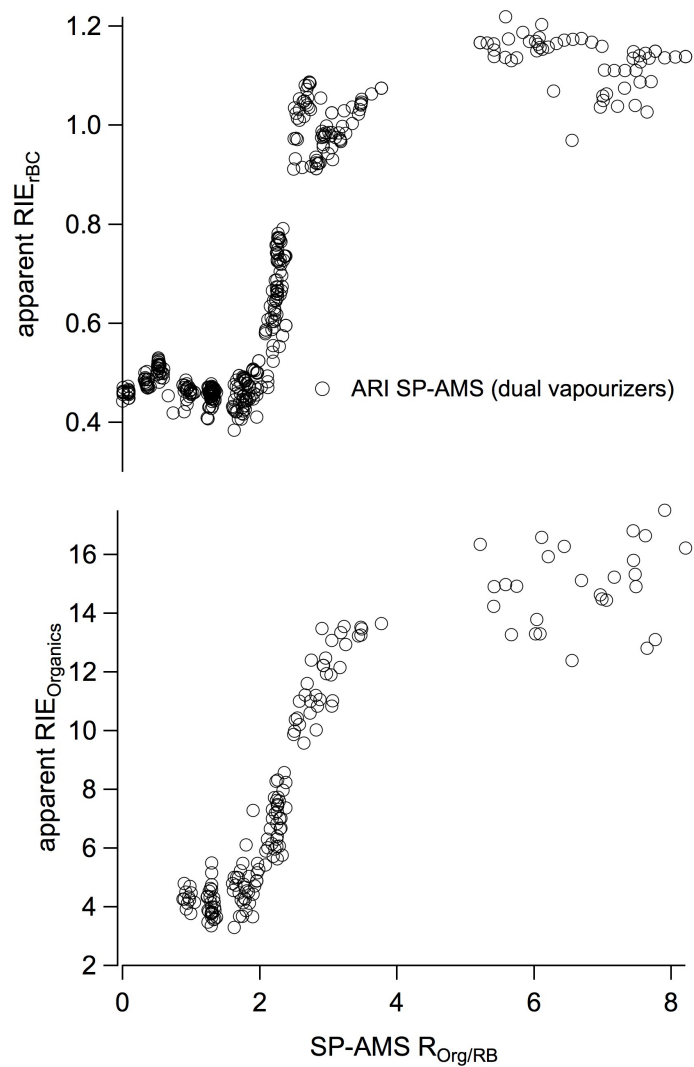


Figure S2: $RIE_{rBC,app}$ (top) and $RIE_{Org,app}$ (bottom) measured as a function of BES coating thickness, demonstrating an increase in sensitivity that reaches saturation at $R_{Org/RB} \sim 3$. Data are plotted against SP-AMS derived $R_{Org/RB}$ because particle mass analyzer measurements were not available during this experiment. $RIE_{Org,app}$ values were obtained from SP-AMS data using measured d_{va} values and assuming that coated particles have a core-shell structure. Data from ARI SP-AMS (SN 215-039).

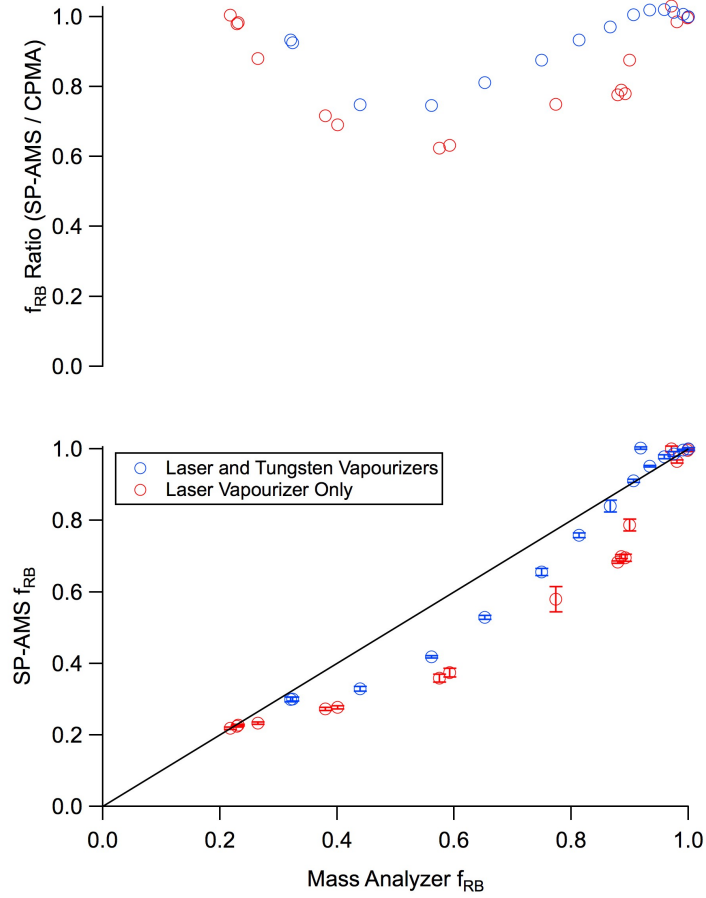


Figure S3: Top: The ratio of SP-AMS fraction of Regal Black (f_{RB}) to the particle mass analyzer f_{RB} as a function of $R_{Org/RB}$. Data from ARI SP-AMS (SN 215-039 (blue) and 215-130 (red)) showing an approximately 40% underestimate in f_{RB} when CE effects are not accounted for. Bottom: The fraction 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_{TBC} (0.2) and RIE_{Org} (1.4).