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*Supplement of*

## **Sources of springtime surface black carbon in the Arctic: an adjoint analysis for April 2008**

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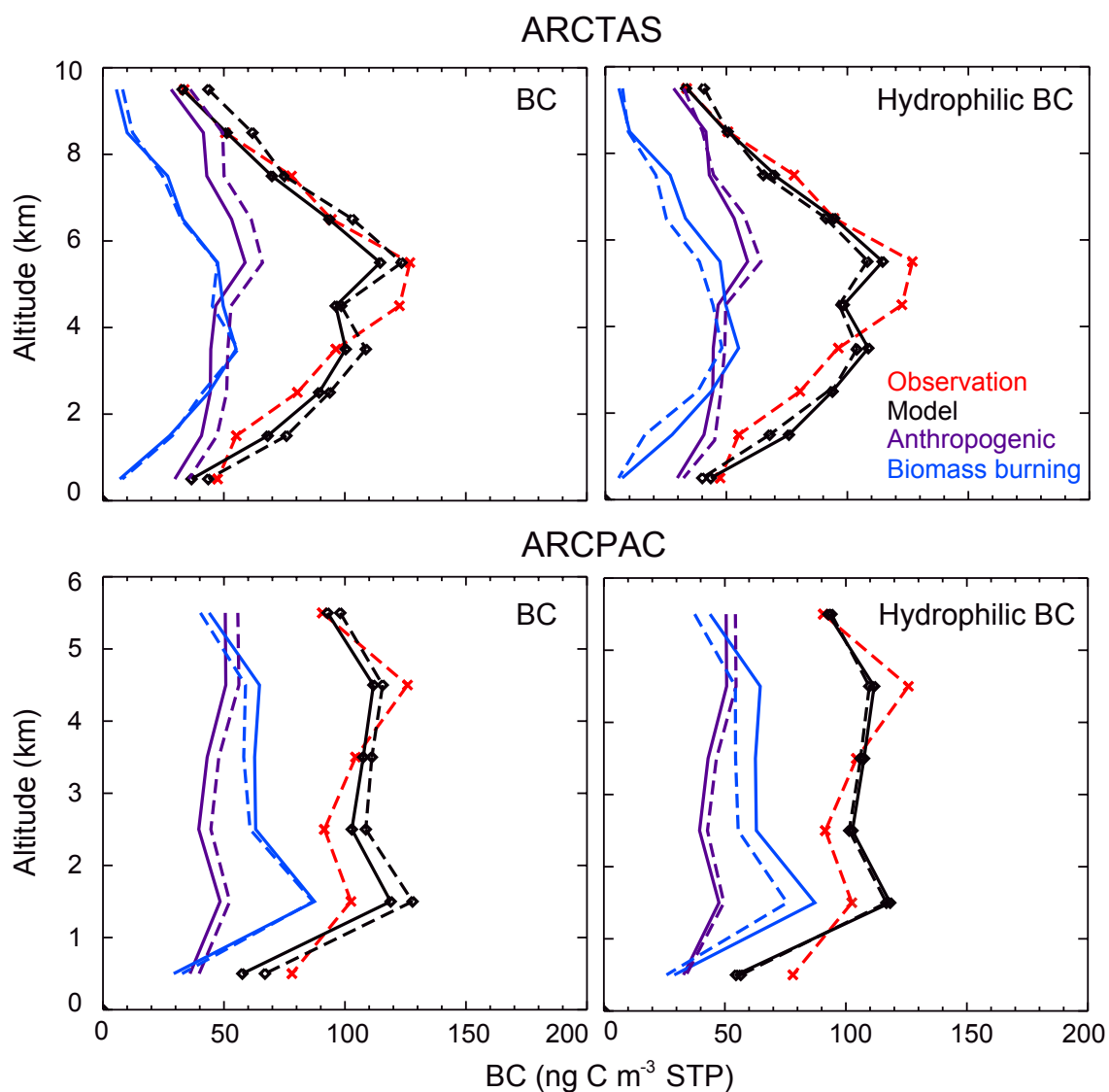
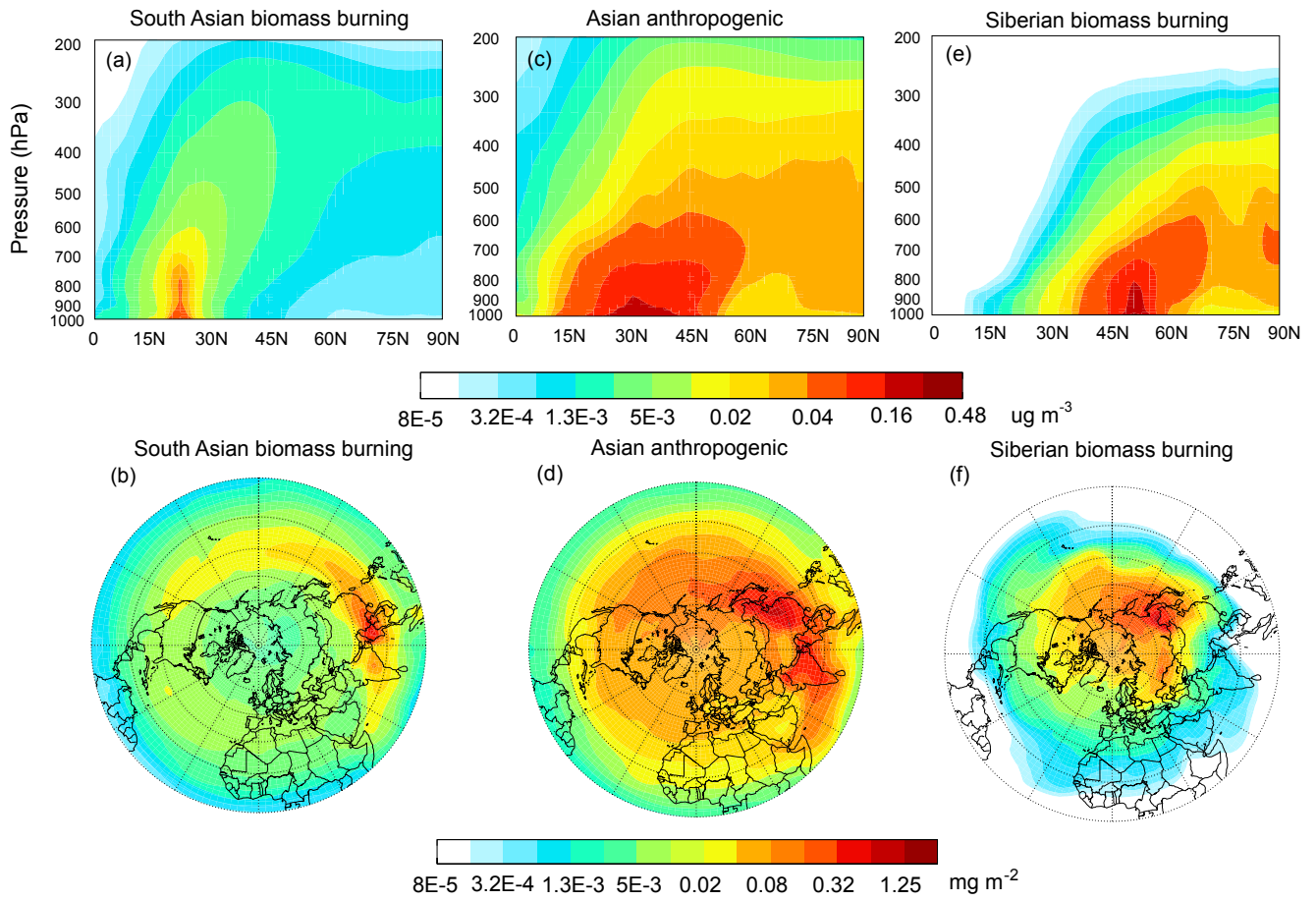


Figure S1: GEOS-Chem simulated vertical distributions total and hydrophilic BC (BCPI) along ARCTAS and ARCPAC flight tracks. Model results are from Experiment E (Table 2), either with an e-folding time of 1.15 days for BC conversion from hydrophobic to hydrophilic (solid lines) or with an OH-dependent BC aging scheme (dashed lines). Also shown are observations (red) and the relative contributions from anthropogenic (purple line) and fire sources (blue line).



**Figure S2: GEOS-Chem simulated (top panels) pressure-latitude cross section of zonal mean BC concentrations ( $\mu\text{g m}^{-3}$ ) and (bottom panels) hemispheric BC column loading ( $\text{mg m}^{-2}$ ) contributed from South Asian biomass burning, Asian anthropogenic, and Siberian Biomass burning emissions. Results are for averages for April 2008.**

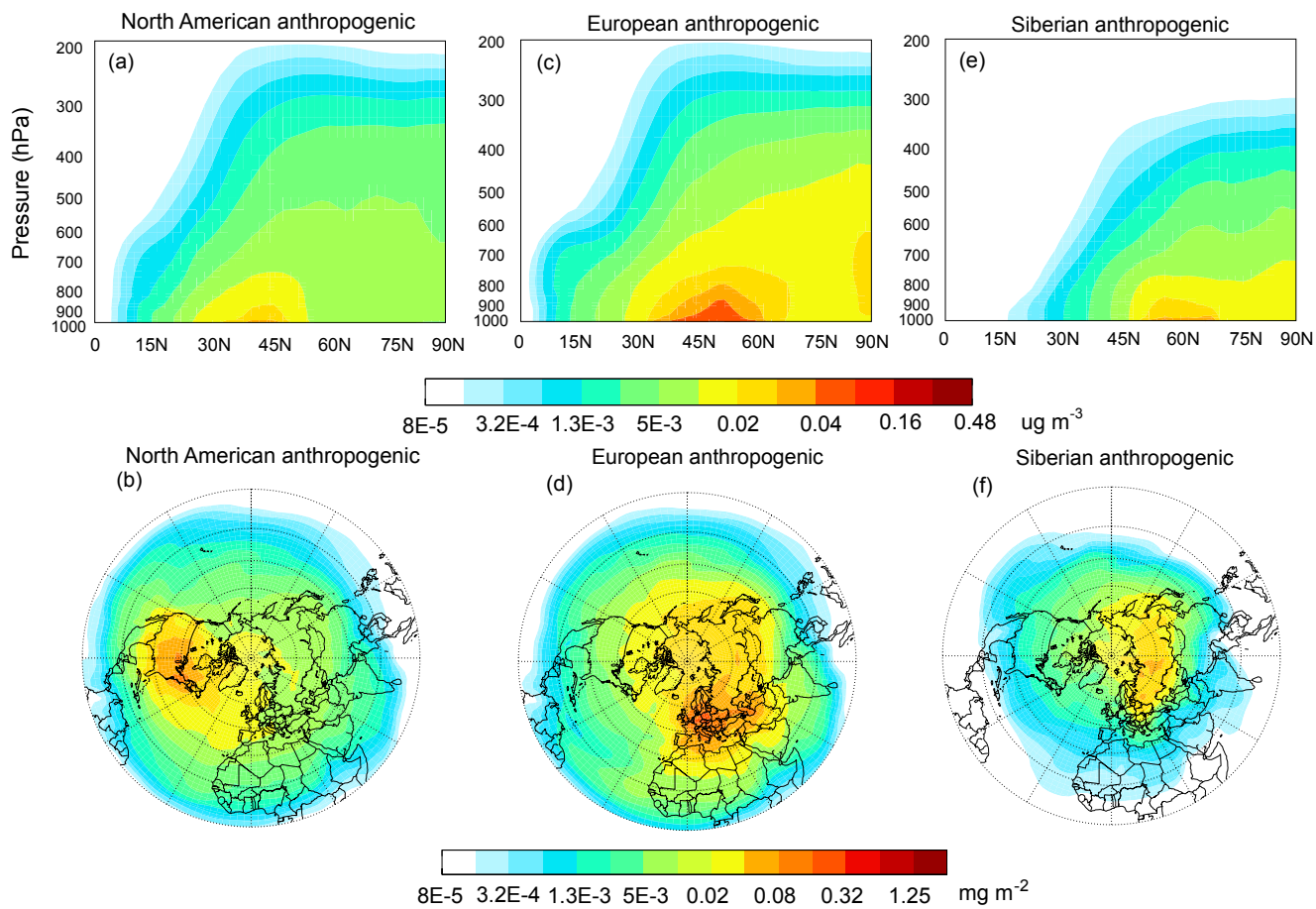


Figure S3: Same as Fig. S2, but for North American, European and Siberian anthropogenic sources.