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Supplement of

Estimates of black carbon emissions in the western United States using the GEOS-Chem adjoint model

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Fig. S1. Sensitivities of surface BC mass to the scaling factors of BC emissions as computed using GEOS-Chem adjoint and the finite difference approximation (Eq. 1, unit: kg / grid box). Results are from 1-week simulations for biomass burning (top panel) and anthropogenic emissions (bottom panel) for August 2006. Solid lines are regression lines.

Fig. S2. (top) Normalized *a posteriori* cost function $J(\mathbf{X}_n)/J(\mathbf{X}_0)$ as a function of the regularization parameter γ_r (Eq. 3) for August 2006. (bottom) Reduction in the normalized cost function $J(\mathbf{X}_i)/J(\mathbf{X}_0)$ at $2^\circ \times 2.5^\circ$ and $0.5^\circ \times 0.667^\circ$ for August 2006.

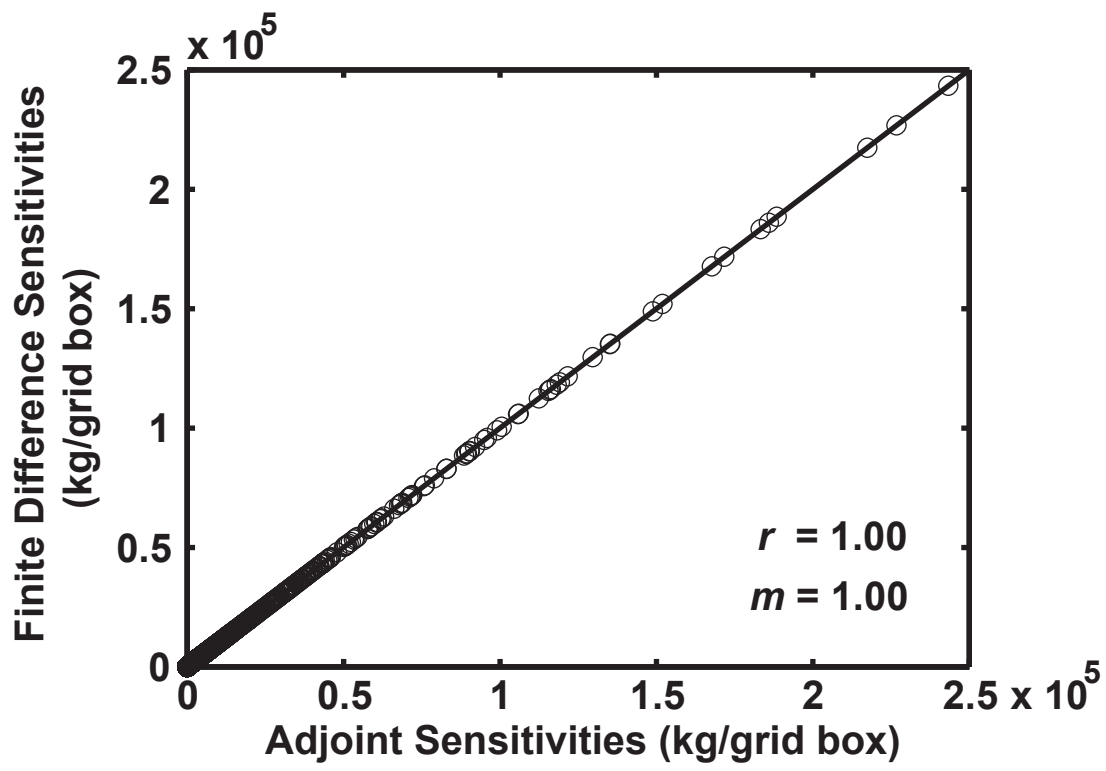
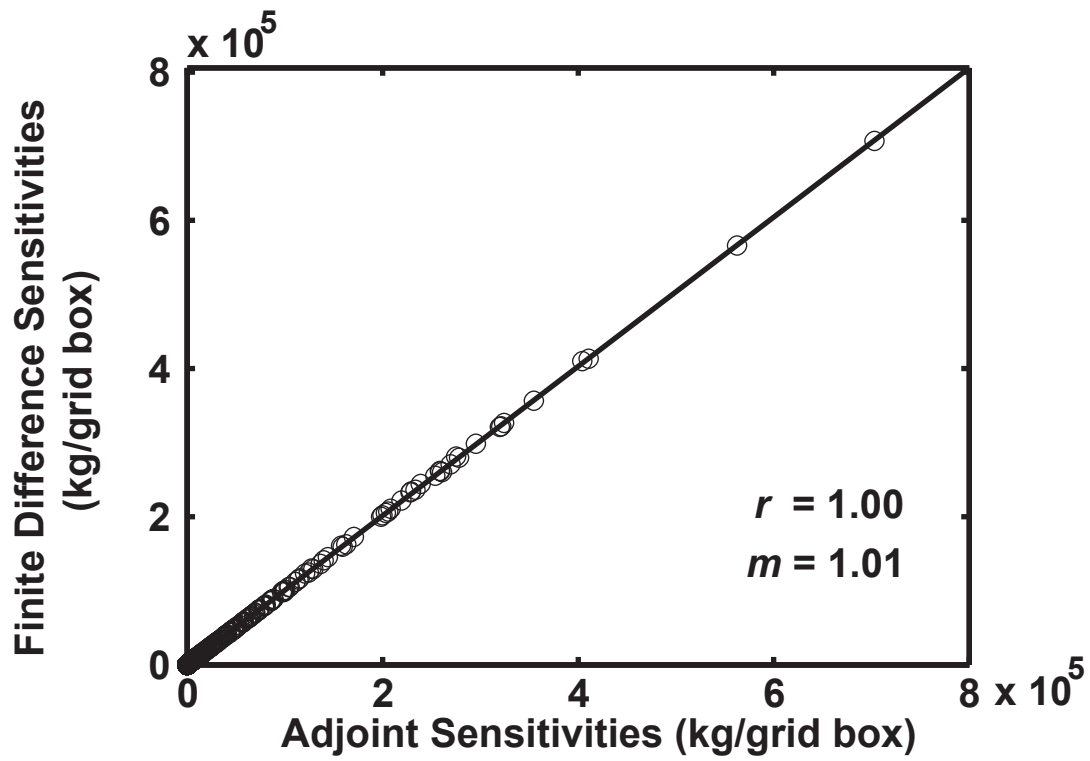


Fig. S1

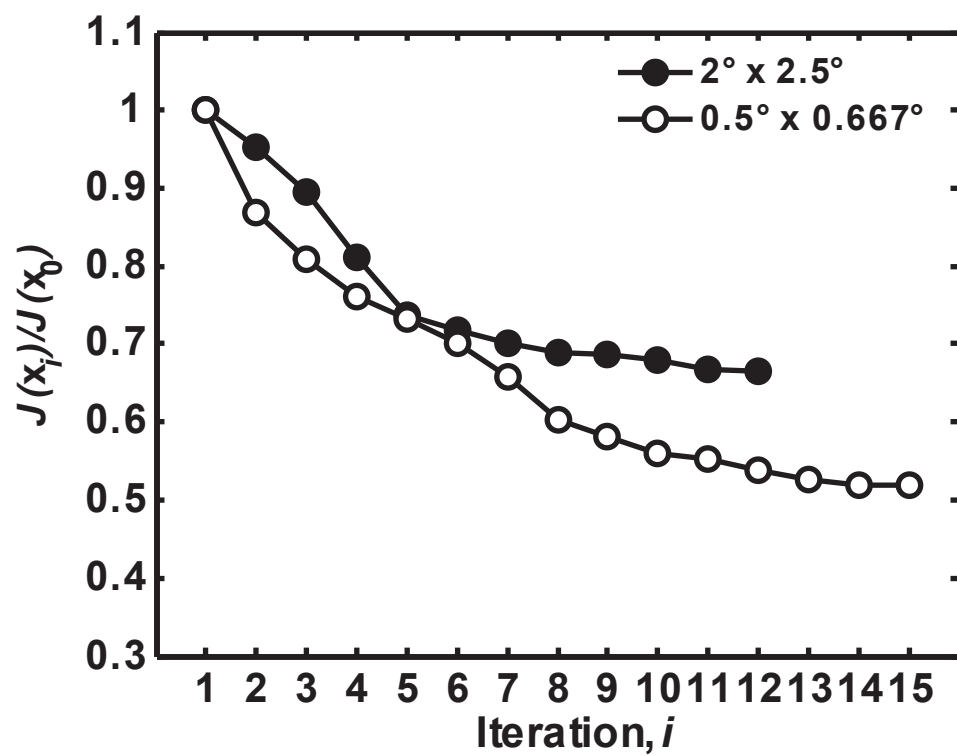
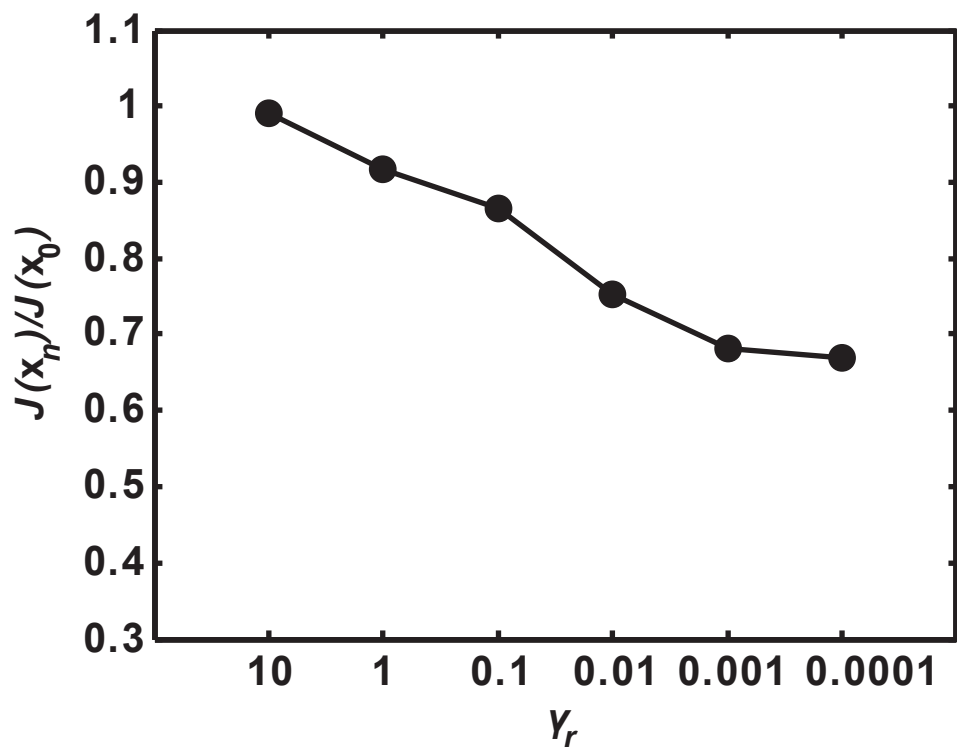


Fig. S2