



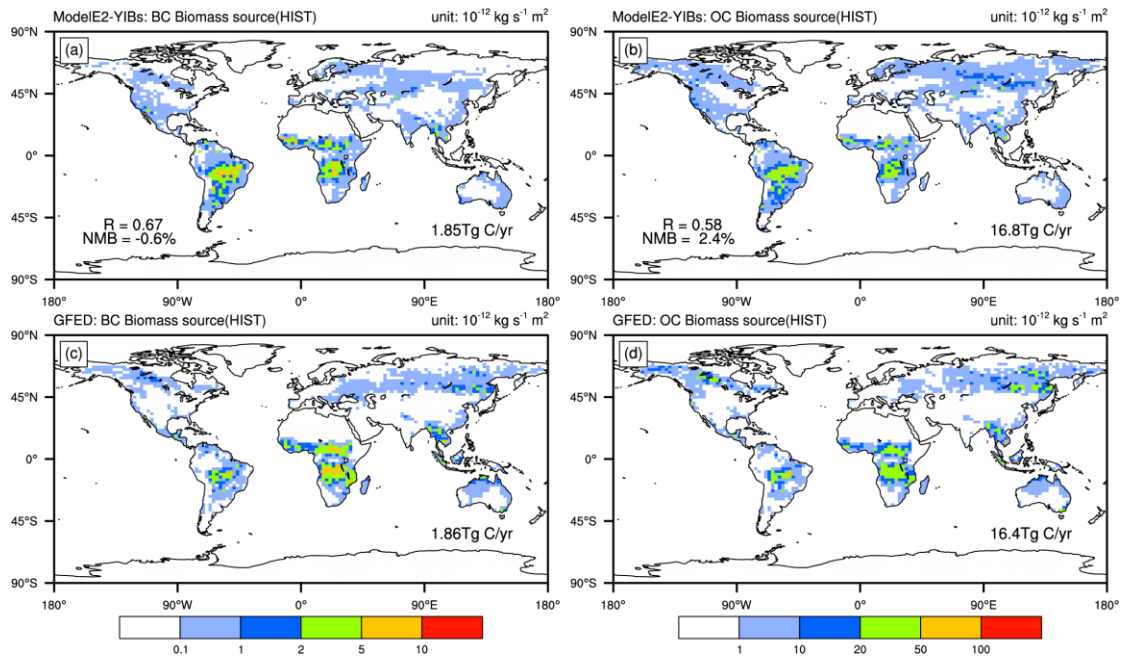
Supplement of

Fire–climate interactions through the aerosol radiative effect in a global chemistry–climate–vegetation model

Chenguang Tian et al.

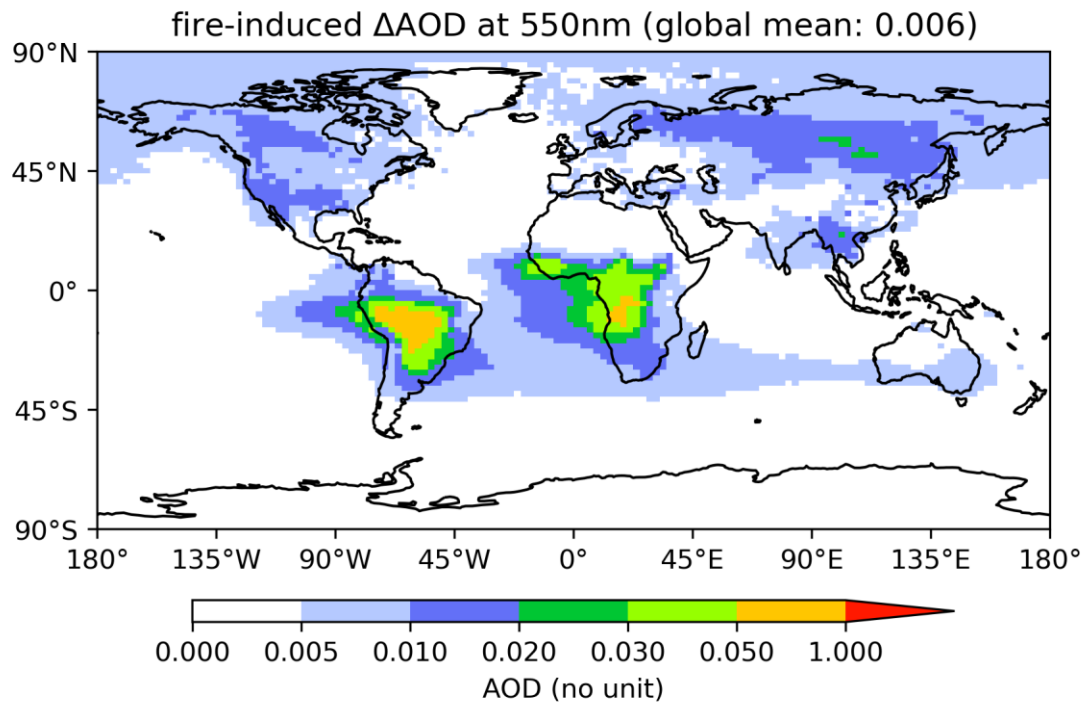
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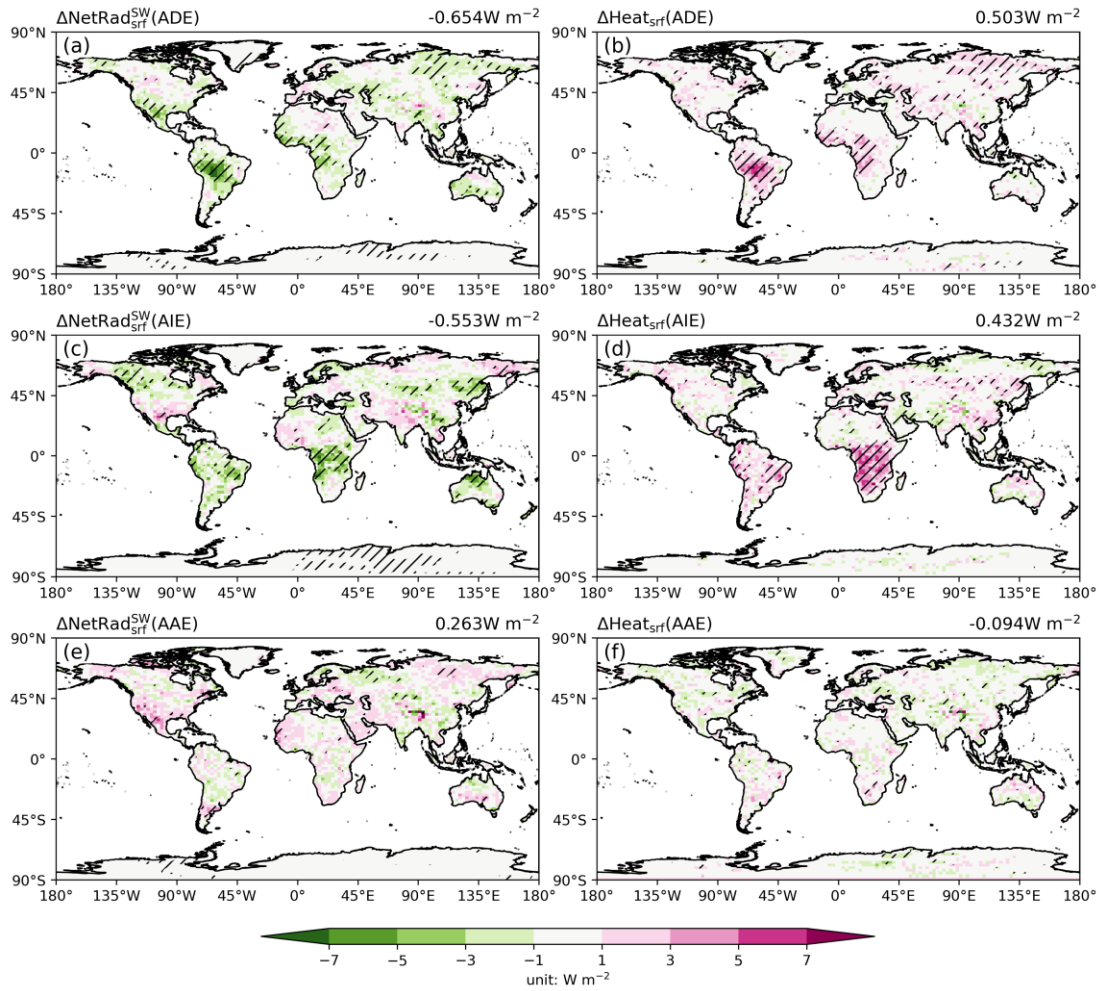
Fig. S1 Annual mean fire emissions of (left) BC and (right) OC (a, b) simulated by ModelE2-YIBs and (c, d) observed from GFED4.1s. Modeling results are from the simulation of YF_AD_AI_AA. The total emission is shown on the bottom right of each panel. The correlation coefficients and normalized mean biases between simulations and observations are shown on the top panels.



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25 **Fig. S2** Annual mean changes in AOD at 550 nm induced by fire.

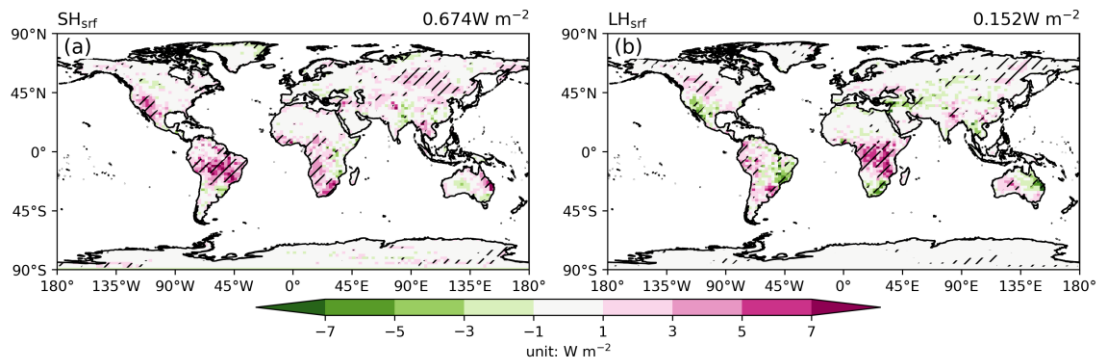
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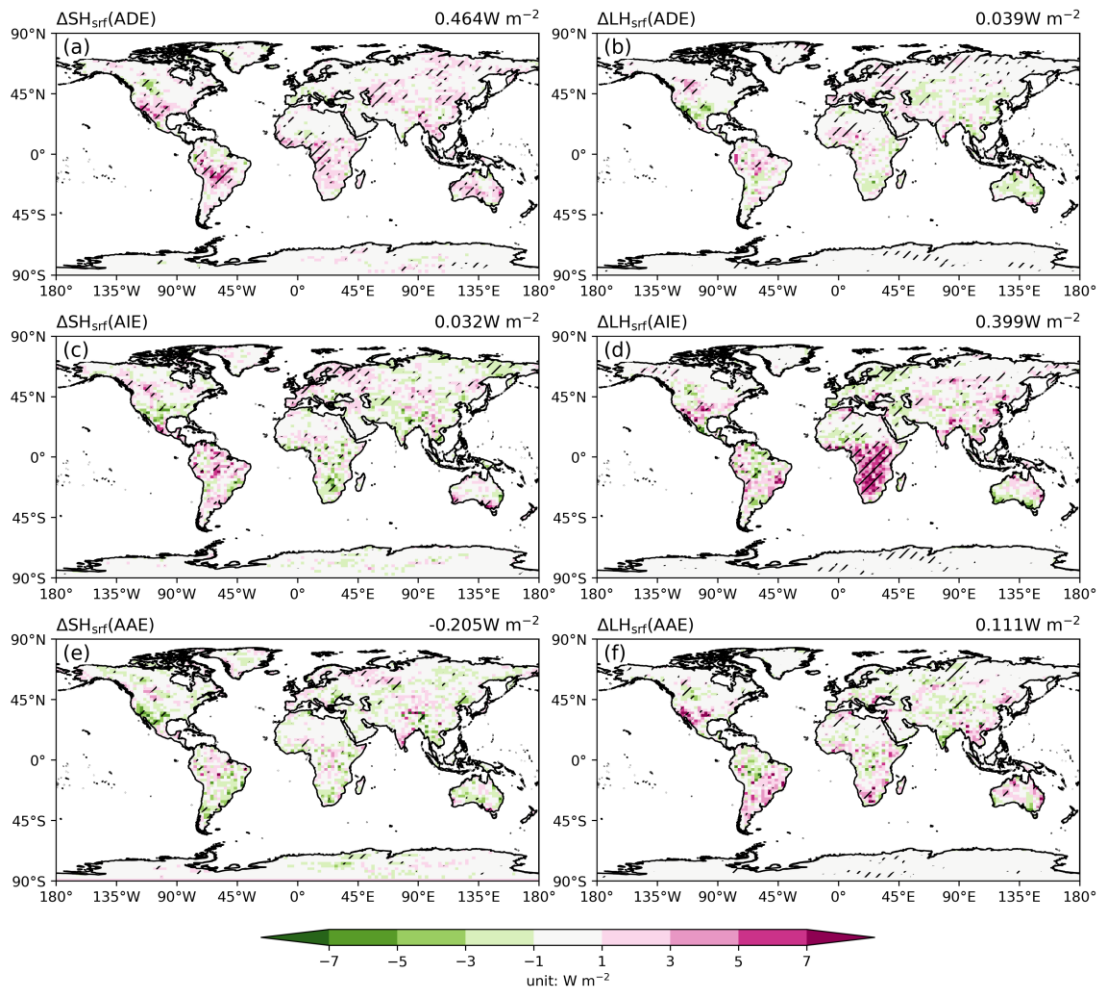
28 **Fig. S3** Changes in surface (left) net shortwave and (right) heat fluxes (sensible + latent) due to (top)
 29 direct effects, (middle) indirect effects, and (bottom) BC-snow feedback of fire aerosols over land
 30 grids. Positive values represent the increase of downward radiation/heat flux. Global land average
 31 is shown at the top of each panel. Slashes denote areas with significant ($p < 0.1$) changes.

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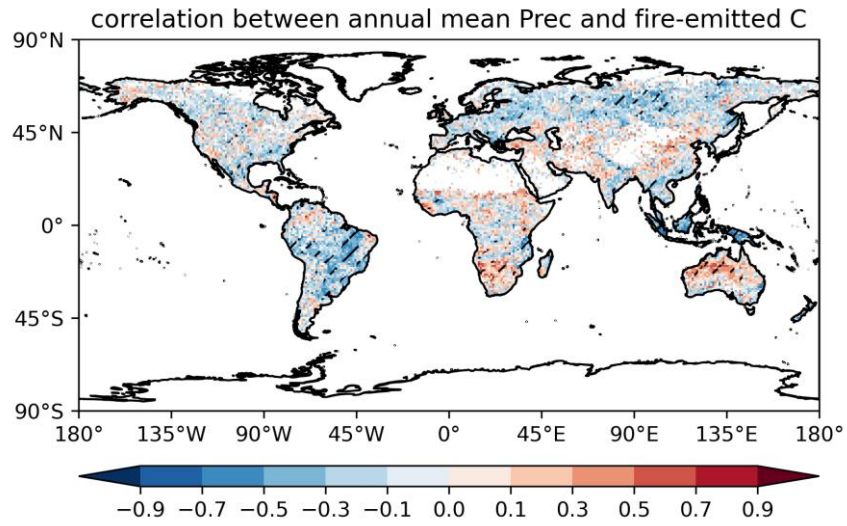
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Fig. S4 Changes in surface (a) sensible and (b) latent heat fluxes caused by fire aerosols. Positive values represent the increase of downward heat flux. Global land average value is shown at the top of each panel. Slashes denote areas with significant ($p < 0.1$) changes.



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Fig. S5 Changes in surface (left) sensible and (right) latent heat fluxes due to (top) direct effects, (middle) indirect effects, and (bottom) BC-snow feedback of fire aerosols over land grids. Positive values represent the increase of downward heat flux. Global land average is shown at the top of each panel. Slashes denote areas with significant ($p < 0.1$) changes.



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46 **Fig. S6** Correlations between annual mean precipitation and fire-emitted carbon in the period of
47 1997-2019. The precipitation and fire-emitted carbon data are from GPCP and GFEDv4s,
48 respectively. Slashes denote areas with significant ($p < 0.1$) correlations.
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