

Biomass burning CHOCHO emission

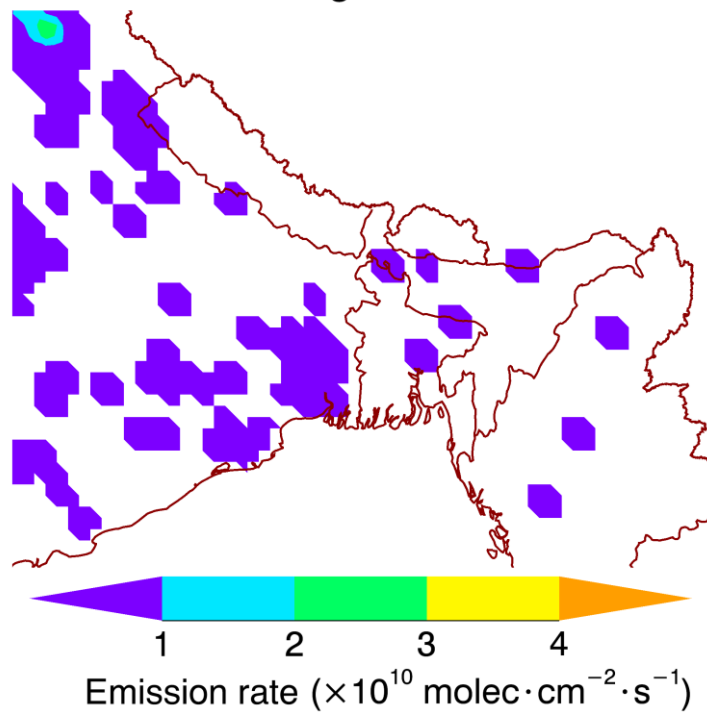
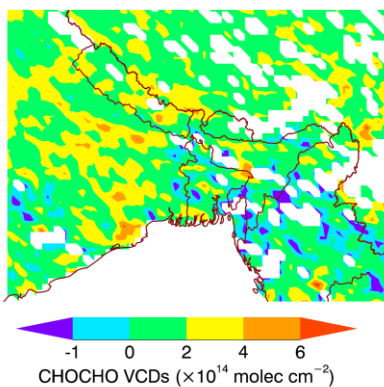
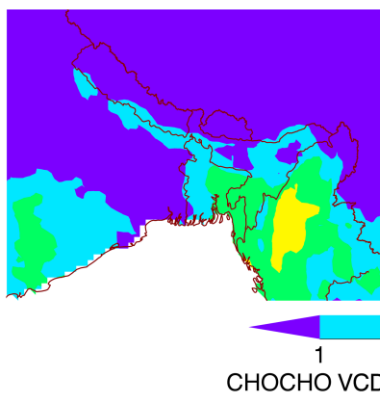


Figure S1: GFED4.1s CHOCHO emission from biomass burning for 2010 October.

(a) $\Delta C_{\text{CHOCHO}} = C_{\text{CHOCHO}}^{\text{SCIAMACHY}} - C_{\text{CHOCHO}}^{\text{REAM}}$



(b) Isoprene contribution to $C_{\text{CHOCHO}}^{\text{REAM}}$



(c) Aromatics contribution to $C_{\text{CHOCHO}}^{\text{REAM}}$

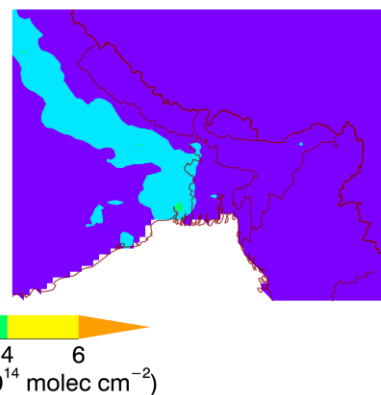
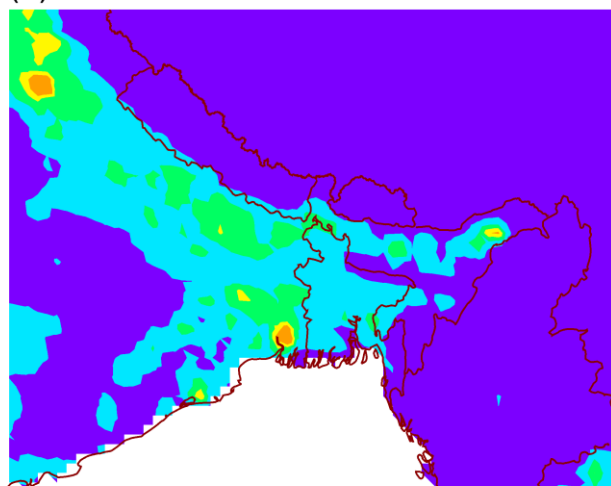


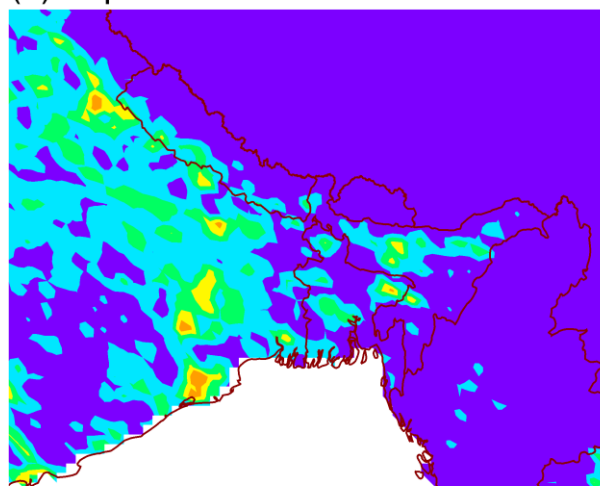
Figure S2: The low bias of model simulated CHOCHO VCDs (a), and simulated isoprene (b) and aromatics (c) contributions to CHOCHO VCDs using the a priori emissions.

(a) INTEX-b aromatics emission



1 2 3 4
Emission rate ($\times 10^{11}$ molec \cdot cm $^{-2}$ \cdot s $^{-1}$)

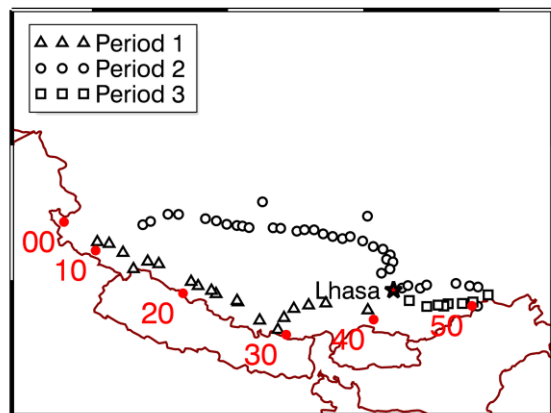
(b) Top-down aromatics emission



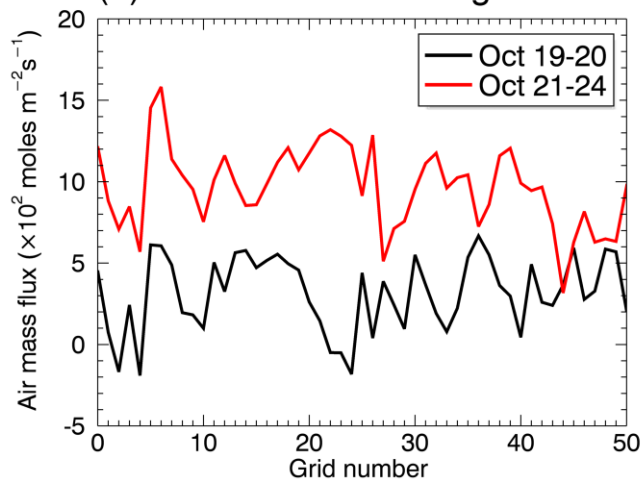
3 6 9 12
Emission rate ($\times 10^{11}$ molec \cdot cm $^{-2}$ \cdot s $^{-1}$)

Figure S3: INTEX-b aromatics emission (a) and Top-down aromatics emission (b). Note the color scale change.

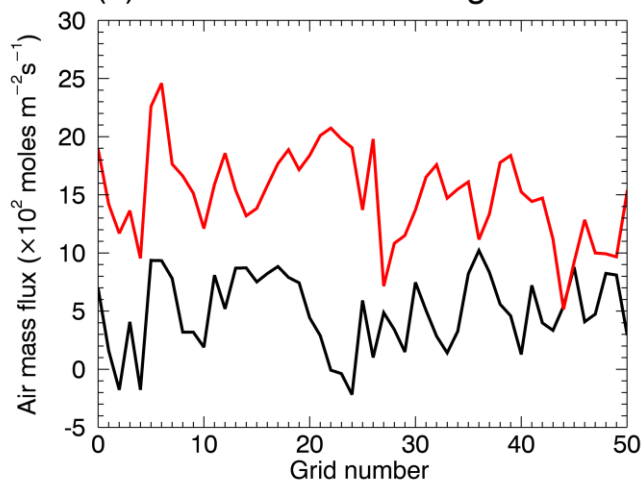
(a) Locations of grids



(b) Below 200m above ground



(c) Below 500m above ground



(d) Below 1000m above ground

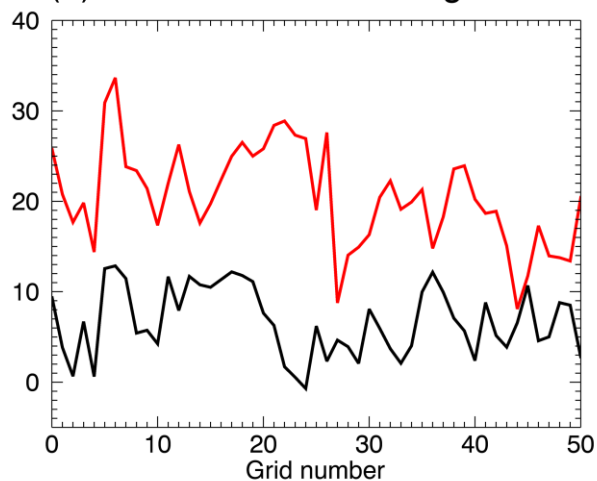
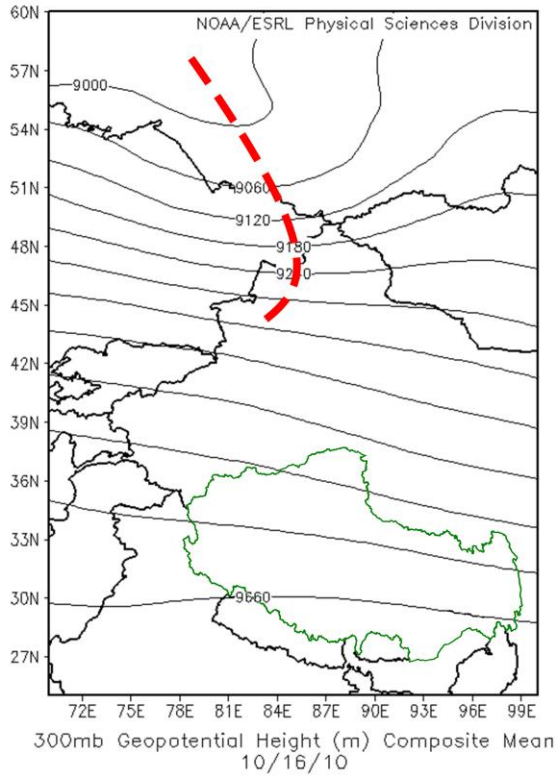


Figure S4: Trans-Himalayas air mass fluxes (positive towards Tibet) during Oct 19-20 (black line) and Oct 21-24 (red line) in the lower atmosphere below 200m (b), 500m (c) and 1000m (d). Red dots in panel (a) denote numbered grid cell locations for computed air mass fluxes; they are used as the x-axis in the other panels.

(a) CFSR geopotential height



(b) WRF geopotential height

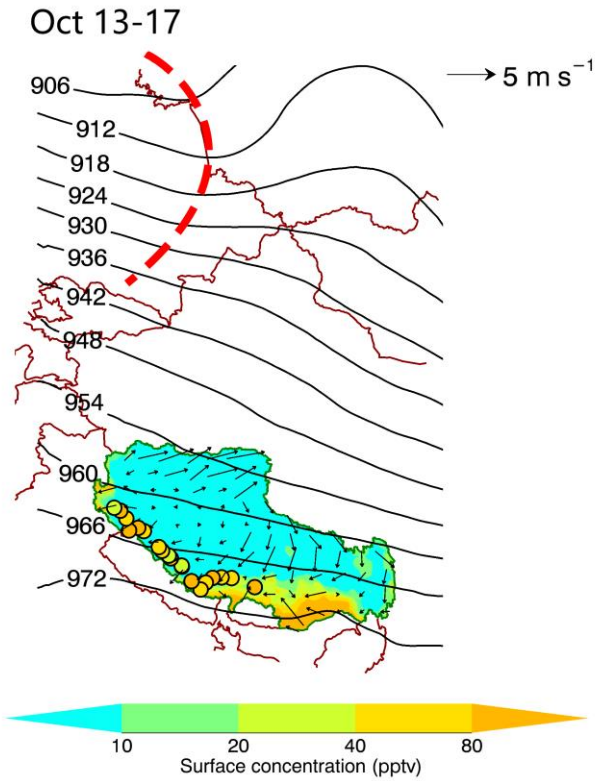


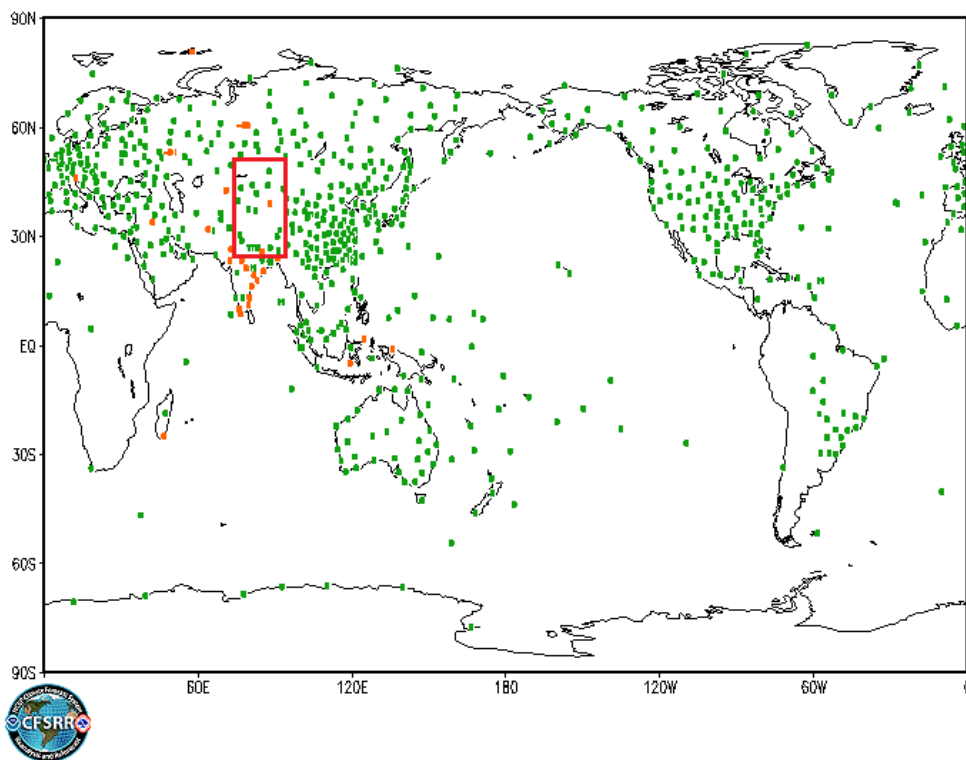
Figure S5: (a) CFSR reanalysis geopotential height at 300hpa on Oct 16 2010 (available at <http://www.esrl.noaa.gov/psd>). (b) Same as Figure 5 for Period 1 (Oct 13-17). Red dashed line represents the trough in 300 hPa.

00Z14OCT2010 CFSR HEIGHT Coverage from RADIOSONDES 300–150 mb

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Figure S6: CFSR 300-150hPa observation coverage (<http://cfs.ncep.noaa.gov/cfsr/atlas/>) on October 14, 2010. The red frame indicates the domain of Figure 5 and Figure S5b.

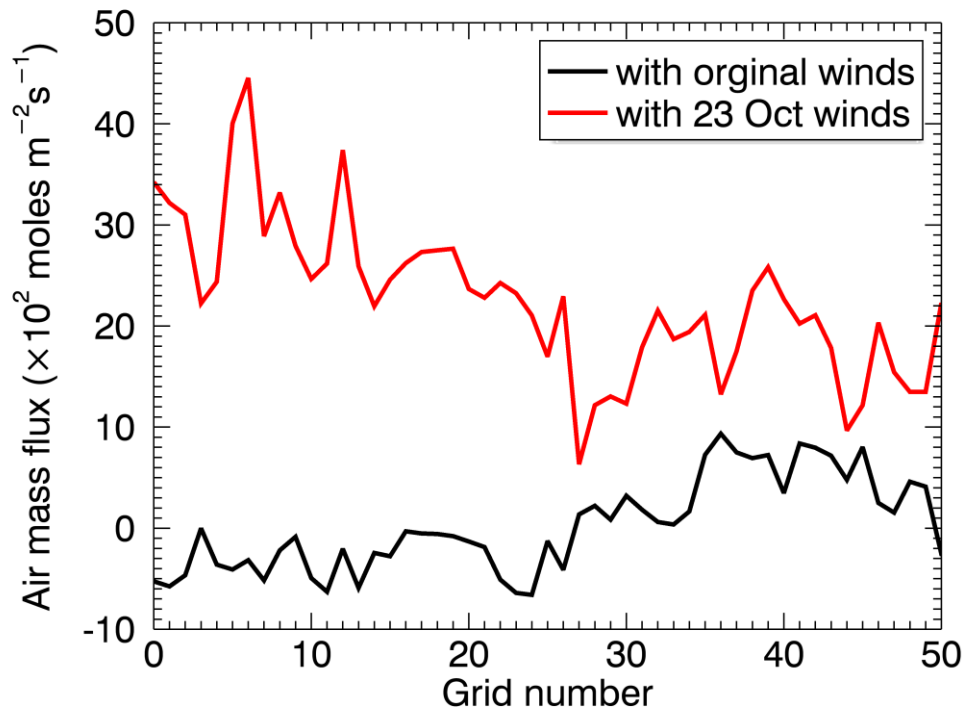


Figure S7: Same as Figure S4 but for ground-1 km air mass fluxes of Period 1 and on October 23 under a cut-off low system, colored as black and red respectively.