

Figure 1. Column-integrated aerosol optical depth for each experiment differenced with respect to the BASE case ($\Delta\tau_e$): (a) XBa and (b) XBh. Note that this optical depth represents only the anthropogenic (BC, OC and SO_4) aerosol component (increase between 1950 and 1990) since the natural (dust and sea salt) component is shared with the BASE case. The contour interval is 0.2.

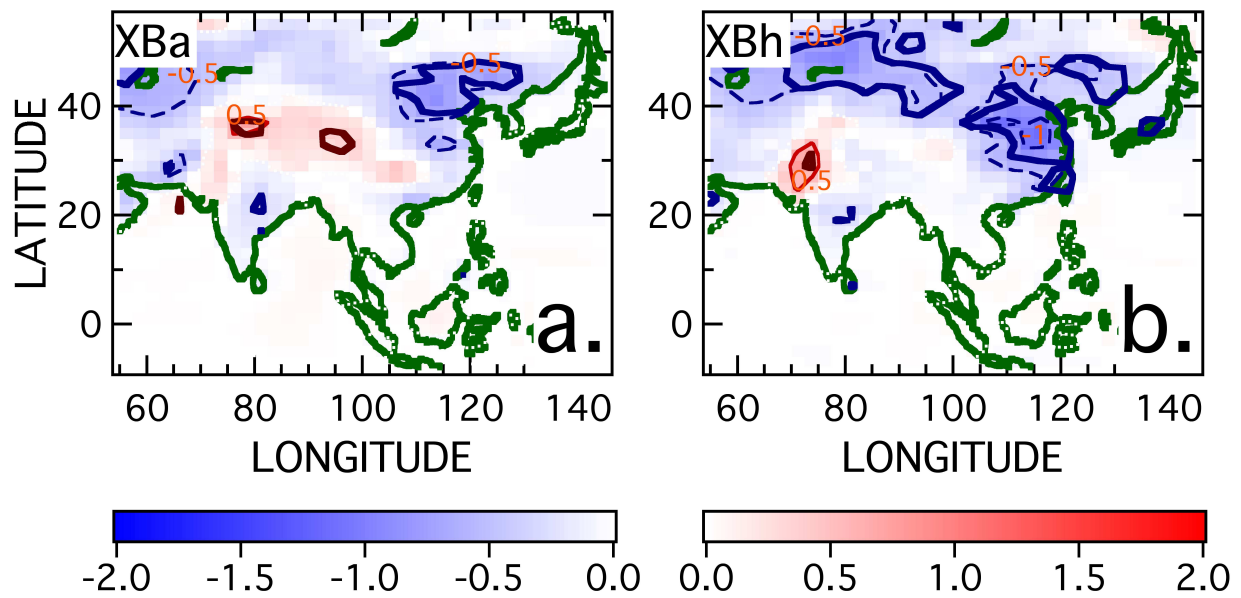


Figure 2. JJA change in surface air temperature (ΔT_s) [K] between the BASE case and (a) XBa and (b) XBh. (e) Observed mean ΔT_s between the 1945-1955 and 1985-1995 decades from the CRU database [Brohan *et al.*, 2006]. Thin, solid (dashed) lines and red (blue) shading indicate positive (negative) ΔT_s (contour interval 0.5 K). Thick blue and red contours enclose regions where ΔT_s is at or above the 90% confidence level.

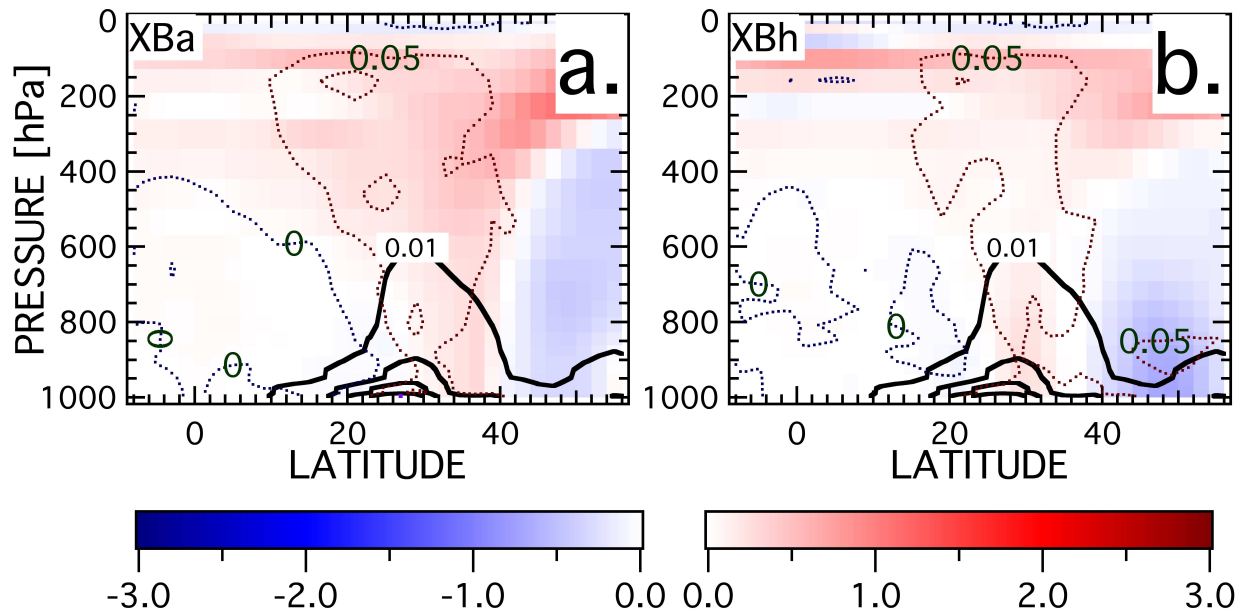


Figure 3. Zonally averaged change in JJA atmospheric temperature (ΔT_{atm}) [K] (shaded) over India (65°E - 90°E) between the BASE case and (a) XBa and (b) XBh. Change in BC mixing ratio relative to the BASE case (thick black contours) with contour interval of $0.01 \mu\text{g m}^{-3}$. Thin, dotted contours indicate the change in short-wave heating rate [K d^{-1}] relative to the BASE case with contour interval of 0.05.

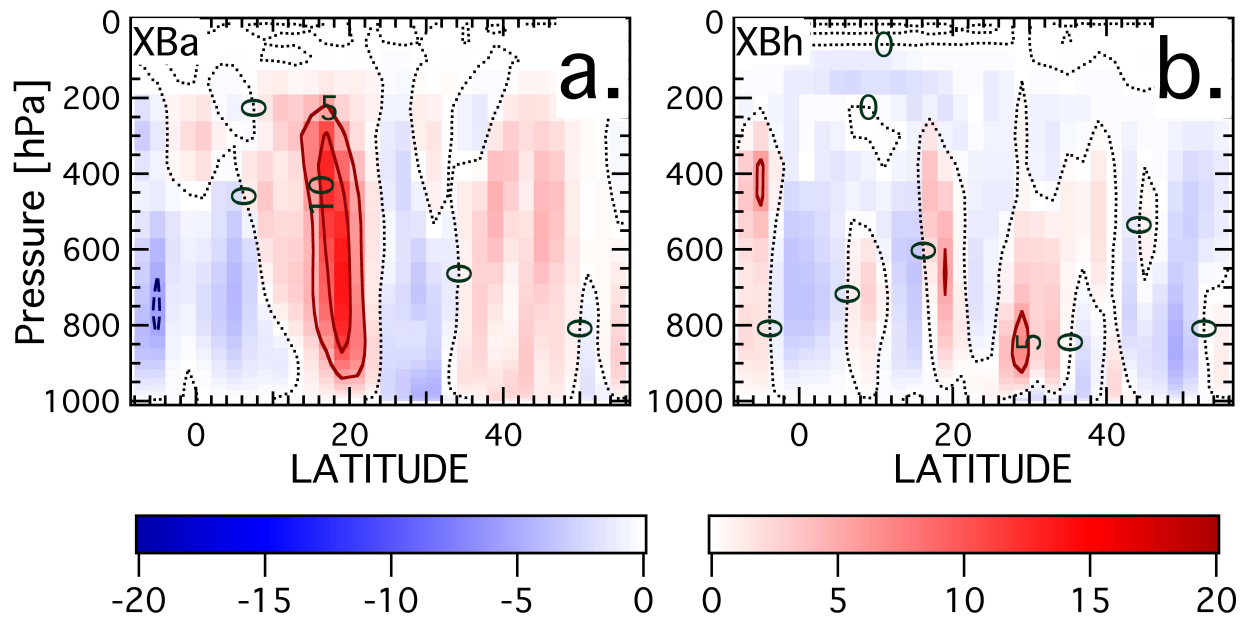


Figure 4. Zonally averaged JJA change in vertical velocity ($\Delta(-w) = \Delta \frac{-dp}{dt}$) between the BASE case and experiments over India ($65^{\circ}\text{E}-90^{\circ}\text{E}$) for (a) XBa and (b) XBh. Note that the negative of the vertical pressure velocity is taken such that red indicates increased vertical motion and blue indicates relative subsidence. The contour interval is $5 \times 10^{-5} \text{ hPa s}^{-1}$.

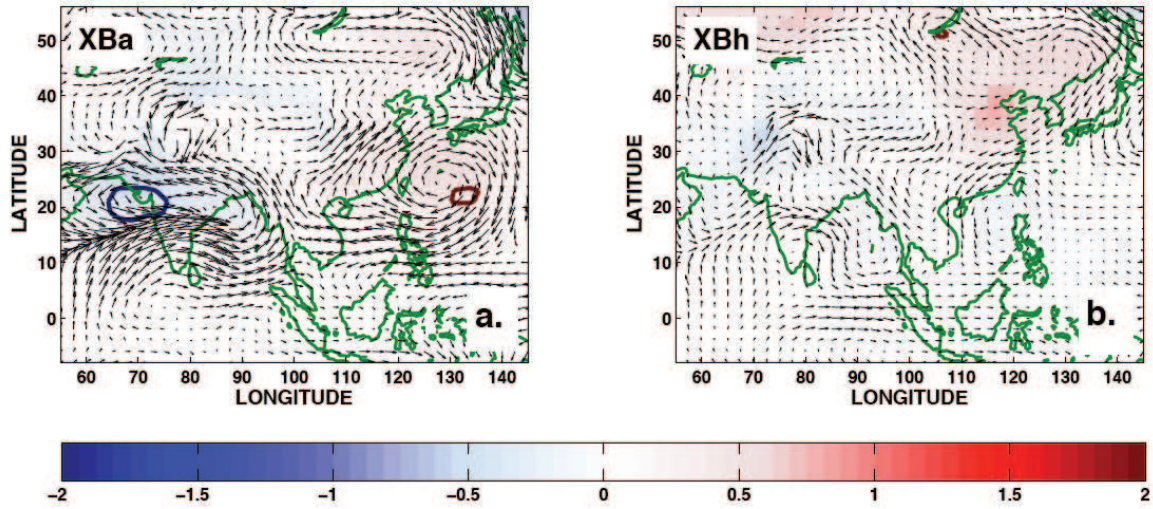


Figure 5. Change in JJA surface pressure (ΔP_{sfc}) [hPa] relative to the BASE case (shaded) for (a) XBa and (b) XBh. Thick blue and red contours enclose regions where ΔP_{sfc} is at or above the 90% confidence level. Changes in the 850 hPa winds relative to the BASE case are plotted as vectors.

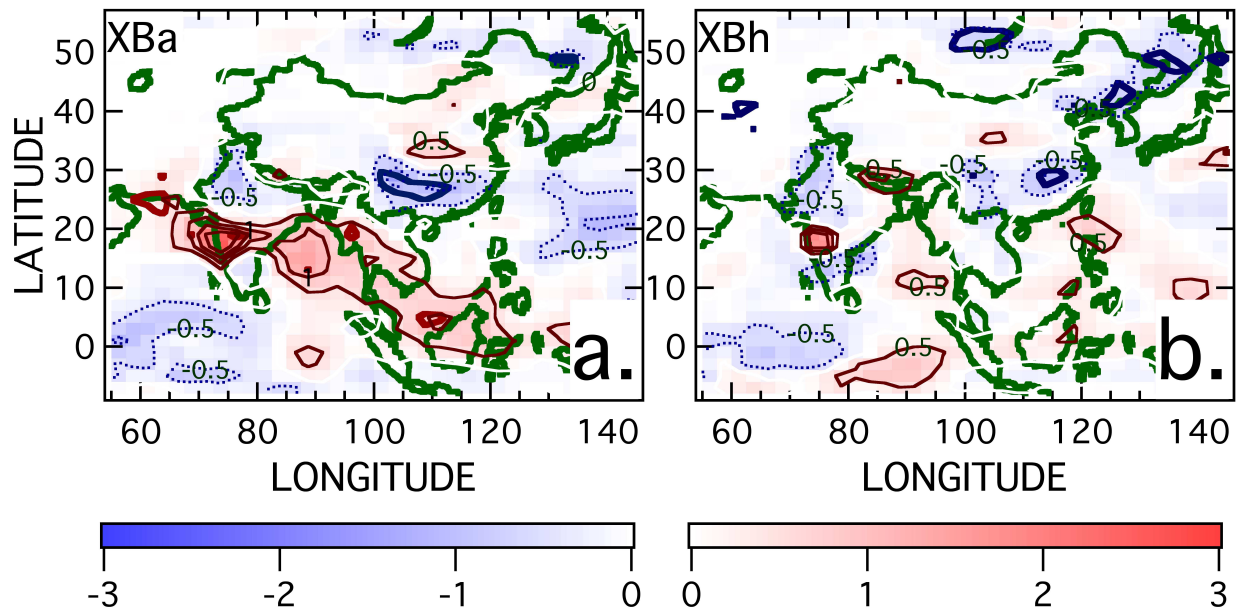


Figure 6. Change in JJA precipitation rate (ΔP) relative to the BASE case for (a) XBa and (b) XBh. Thin, solid (dotted) contours and red (blue) shading indicate positive (negative) ΔP (contour interval of 0.5 mm d^{-1}). Thick red and blue contours inclose regions where ΔP is at or above the 90% confidence level.

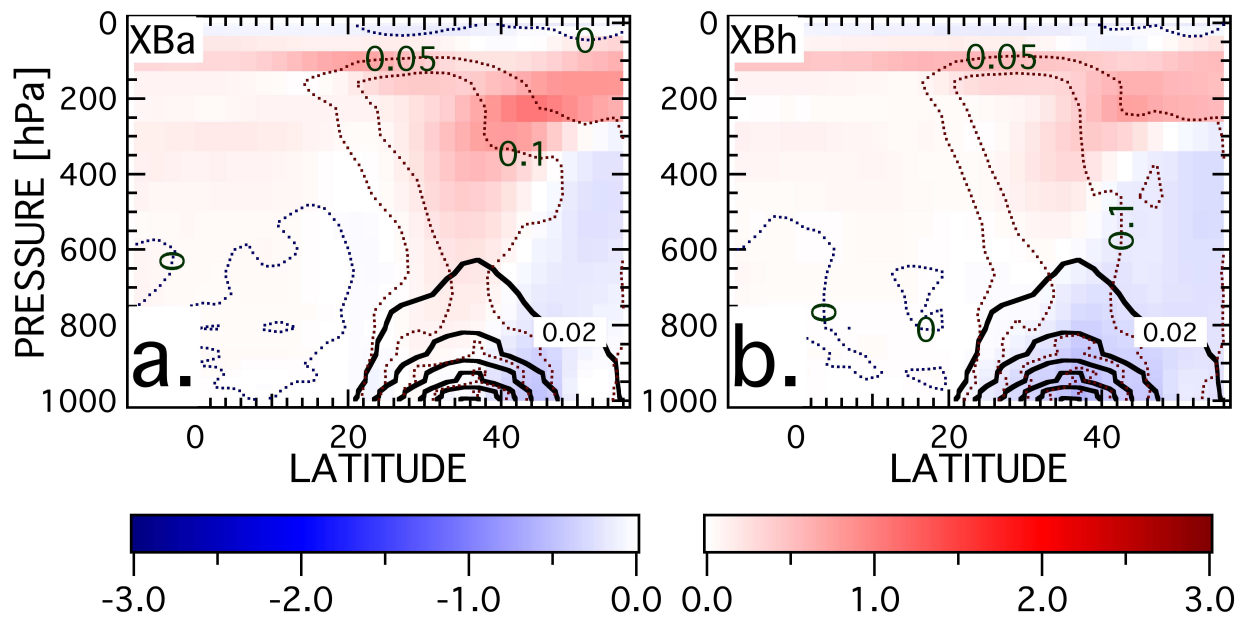


Figure 7. Same as Figure 3 (ΔT_{atm} , BC mixing ratio change, and shortwave heating rate change) except zonally averaged over China (90°E-130°E).

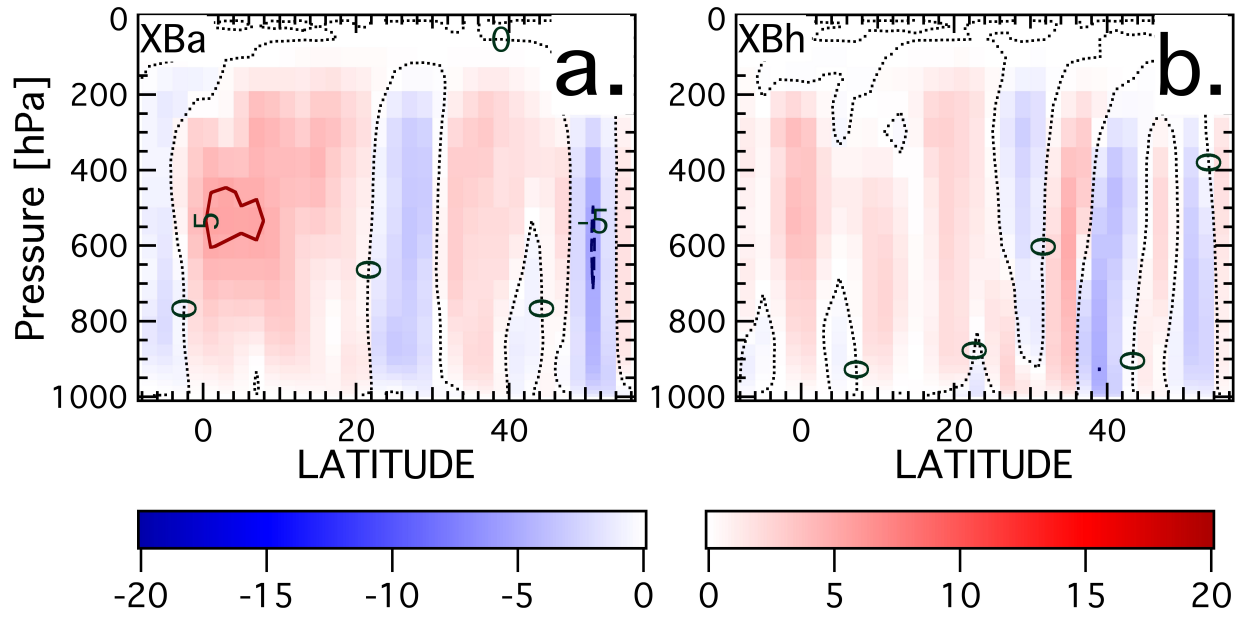


Figure 8. Same as Figure 4 ($\Delta(-w) = \Delta \frac{-dp}{dt}$; contour interval $5 \times 10^{-5} \text{ hPa s}^{-1}$) except zonally averaged over China ($90^\circ\text{E}-130^\circ\text{E}$)

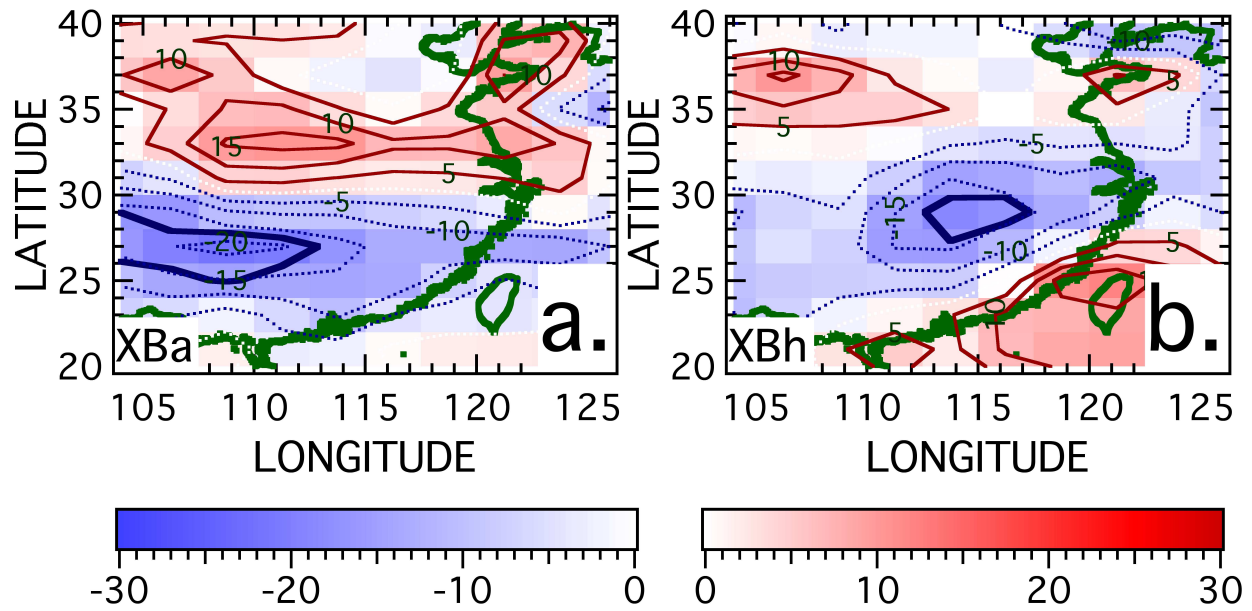


Figure 9. Percent change in total precipitation rate relative to the BASE case $((\text{EXP}-\text{BASE})/\text{BASE}) \times 100$ over China for: (a) XBa and (b) XBh. (e) Observed percent change in total precipitation between the 1985-1995 decade and the 1945-1955 decade from the CRU database [Brohan *et al.*, 2006]. Solid (dotted) contours and red (blue) shading indicate increased (decreased) precipitation (5% contour interval). Thick blue and red contours enclose regions where the change in precipitation is at or above the 90% confidence level.