Supplemental Material

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Dependence of Fast Changes in Global and Local Precipitation on the Geographical Location of Absorbing Aerosol
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Supplementary materials for "*Dependence of fast changes in global and local precipitation on the geographical location of absorbing aerosol*"

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1. Supplementary Figures

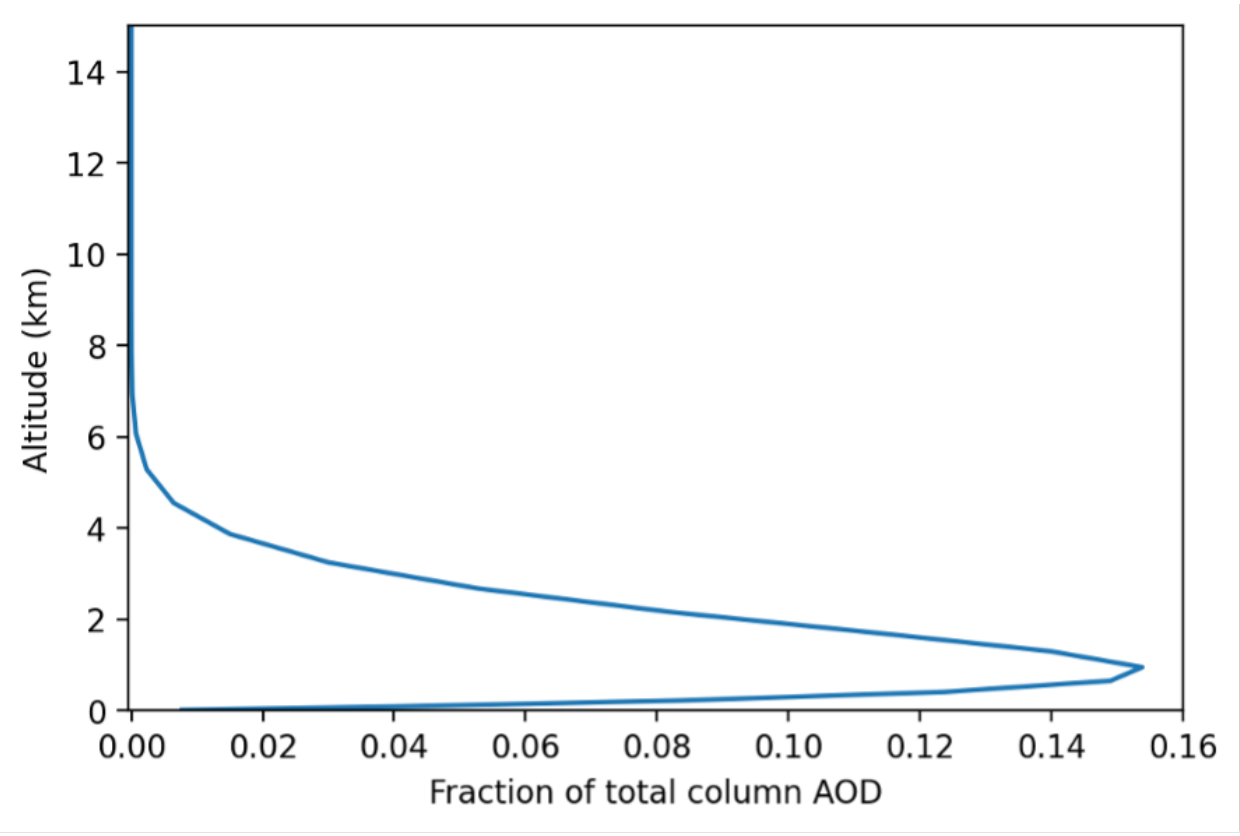

FIG. 1. Vertical profile of fractional aerosol optical depth at 550nm with respect to the column integral. The vertical axis denotes the approximate altitude above the local surface.

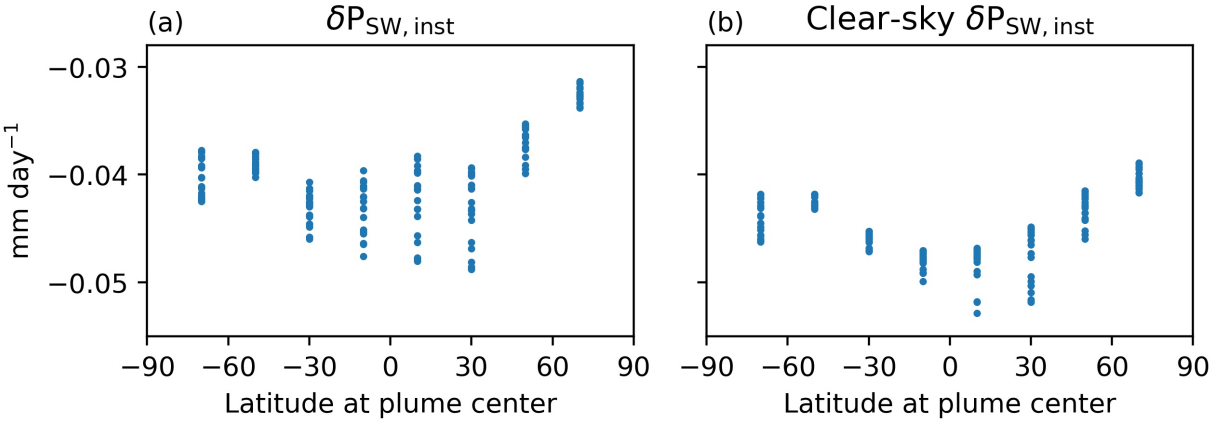

FIG. 2. Global- and time-mean changes in precipitation resulting from instantaneous changes in shortwave absorption (SW_{inst}, panel a), and the contribution from clear-sky (b). This plot shows that the contribution of shortwave absorption drops off towards the poles because of the decrease in incoming solar radiation.

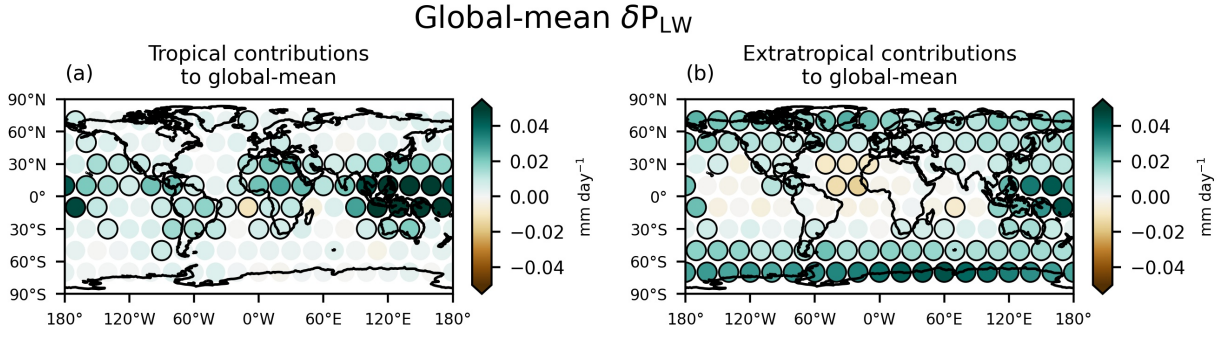

FIG. 3. Contributions of tropical changes (±30° latitude) (a) and extratropical changes (everywhere else) (b) to the global-mean changes in δP_{LW}, the sum of panels (a) and (b) is equal to Fig. 1b. Each colored circle represents the results from the simulation imposing an aerosol perturbation in that location.

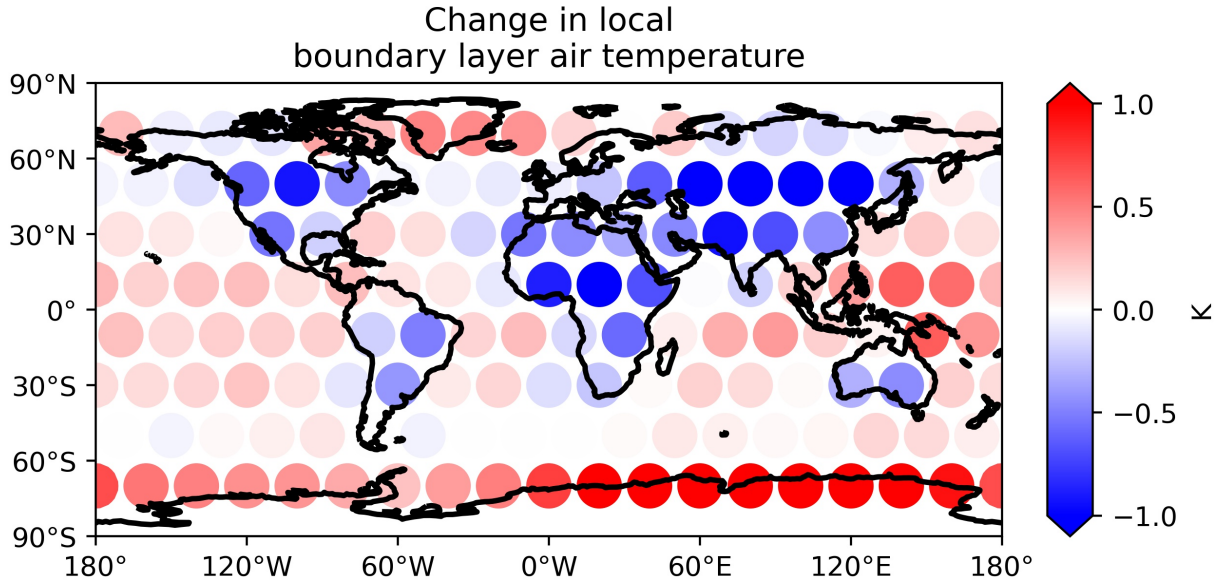

FIG. 4. Local- and time-mean changes in the average temperature boundary layer (defined as the temperature of the lowest model level) for each of the 144 plume experiments. "Local" is defined as an average over the region containing 95% of the AOD perturbation. Each colored circle represents the results from the simulation imposing an aerosol perturbation in that location.

References