

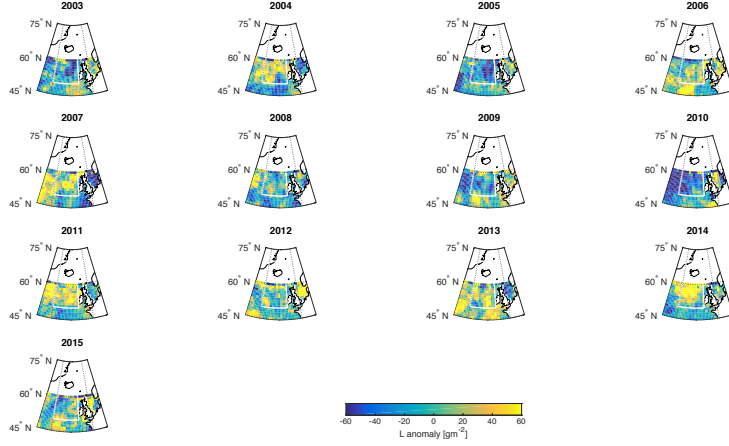


Figure S1: L anomalies for December months 2003-2015, relative to the 2003-2013 mean. Iceland region indicated as white box.

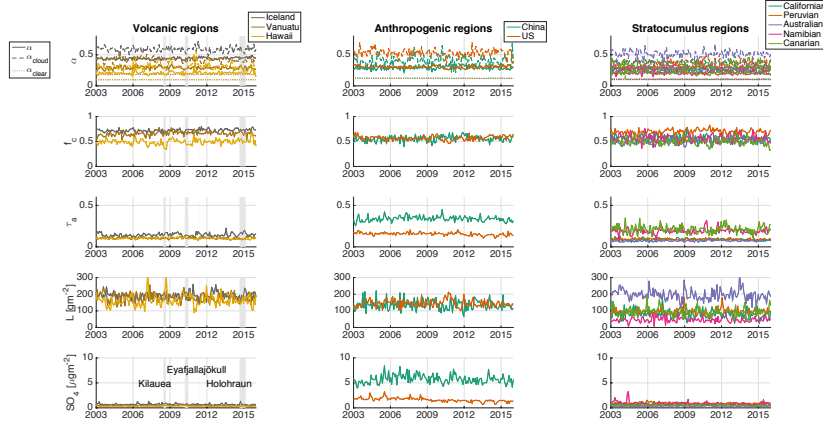


Figure S2: As Figure 2, but for MERRA-2 reanalysis, showing albedo (α), cloud fraction (f_c), aerosol optical depth (τ_a), liquid water path (L), sulfate mass concentration (SO_4). Note the deviating scale for SO_4 for the China and US regions.

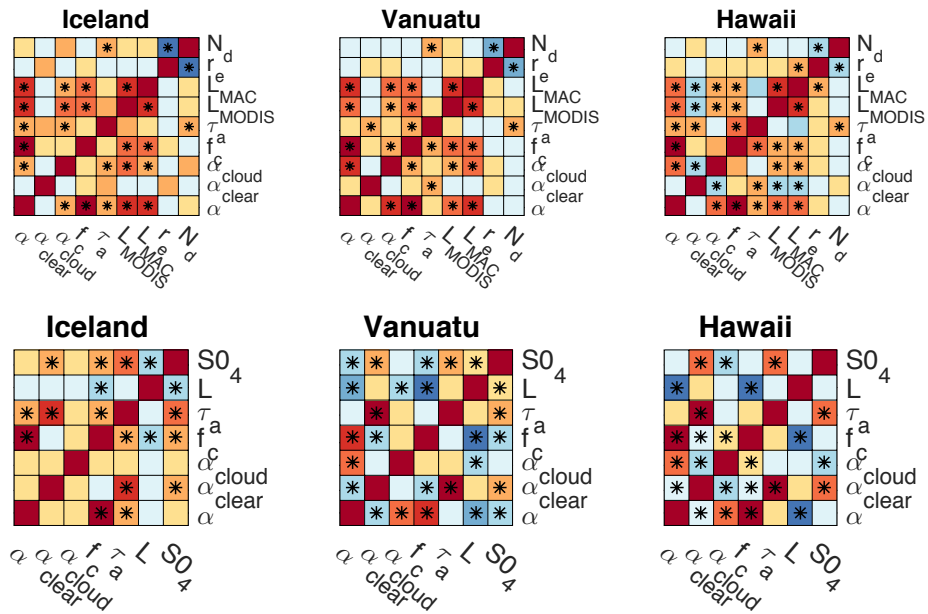


Figure S3: As Figures 3 and 4, but for volcanic regions only, excluding the “volcanic months” marked in Figure 2. a) satellite observations, b) MERRA-2 reanalysis.

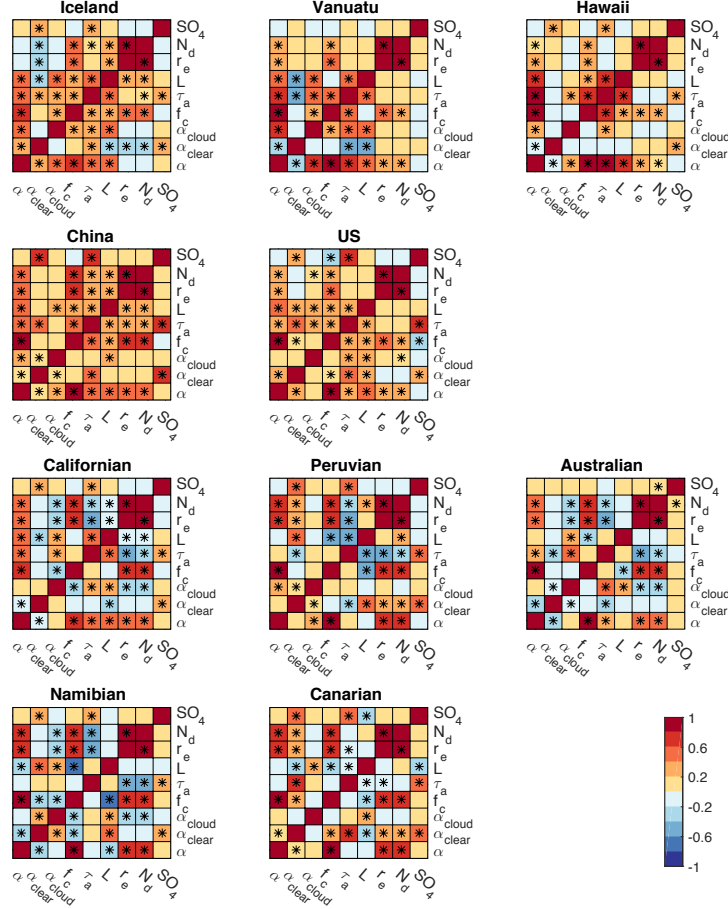


Figure S4: Correlation-matrices for IPSL-CM5A-LR for albedo (α), cloud fraction (f_c), aerosol optical depth (τ_a), liquid water path (L), effective radius (r_e), droplet number concentration (N_d) and sulfate mass loading. Temporal correlations of monthly mean de-seasonalized time series for 10 simulated years (1996-2005) are shown. Correlations significant at 95% confidence level (using a student t-test) are marked with an asterisk.

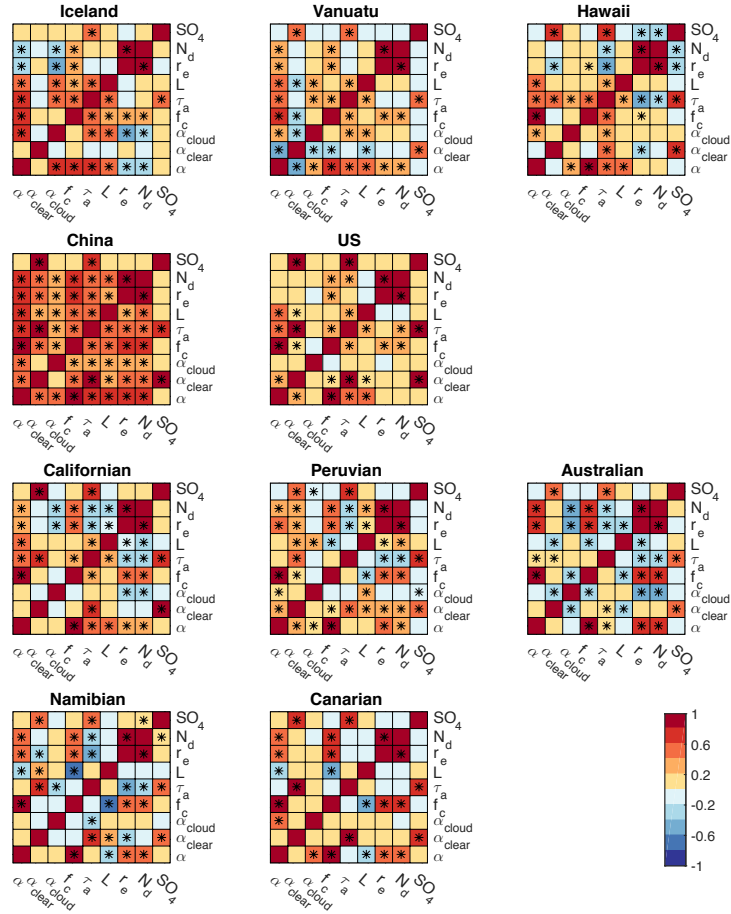


Figure S5: As in Figure S4 but for IPSL-CM5A-MR.

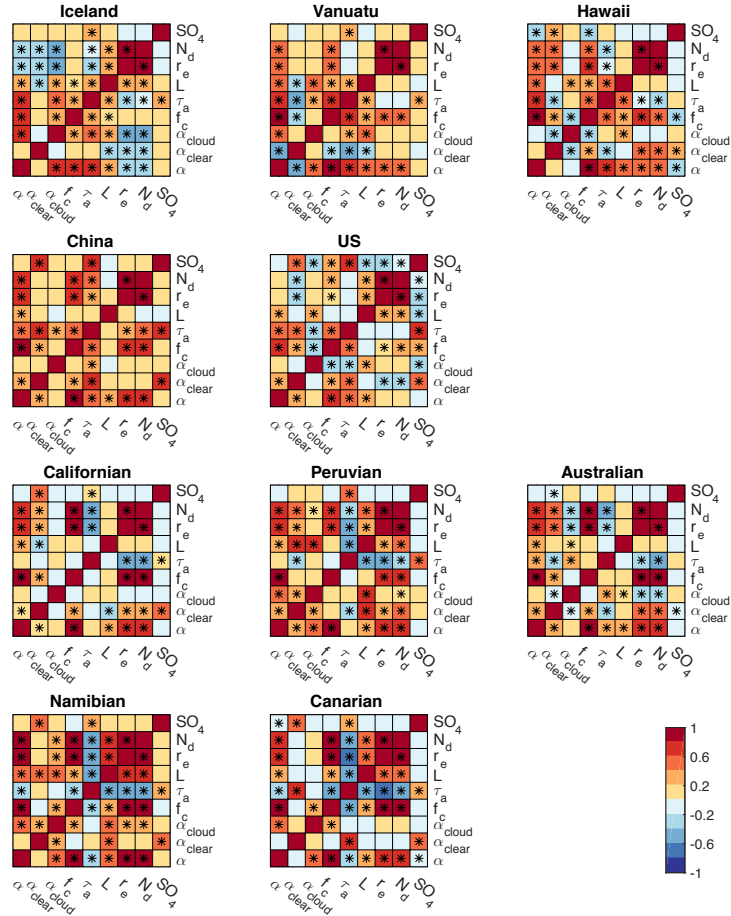


Figure S6: As in Figure S4 but for IPSL-CM5B-LR.

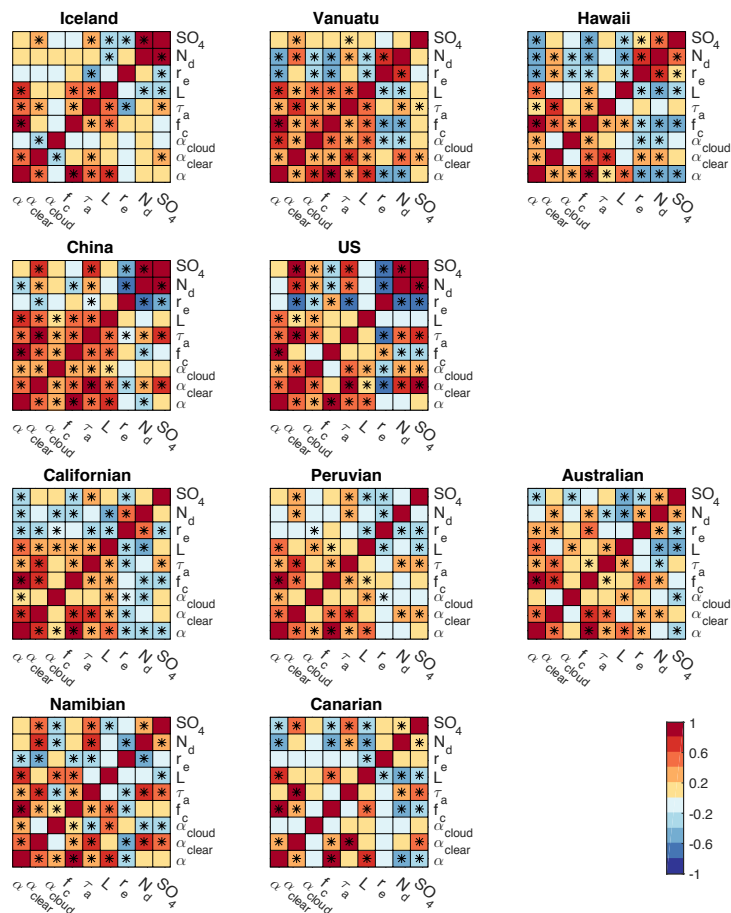


Figure S7: As in Figure S4 but for MIROC5.

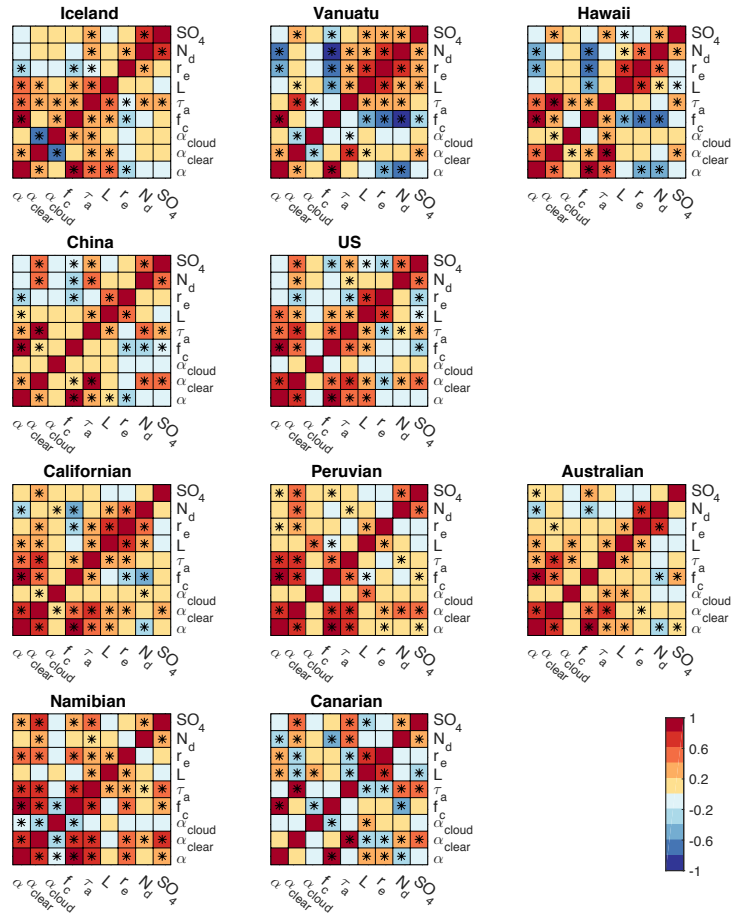


Figure S8: As in Figure S4 but for MIROC-ESM.

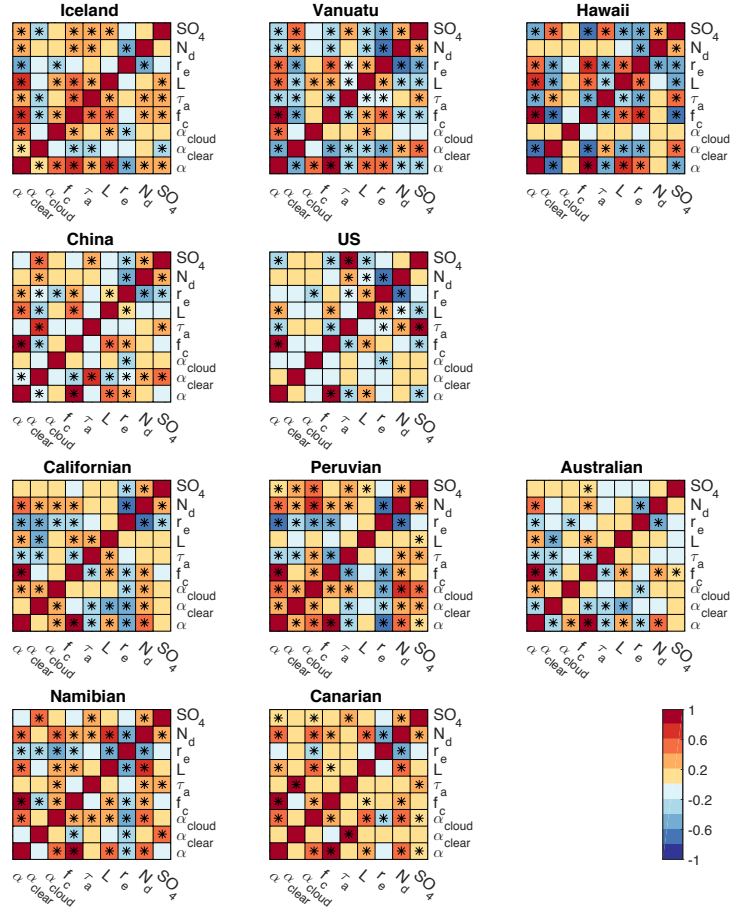


Figure S9: As in Figure S4 but for MRI-CGCM3.

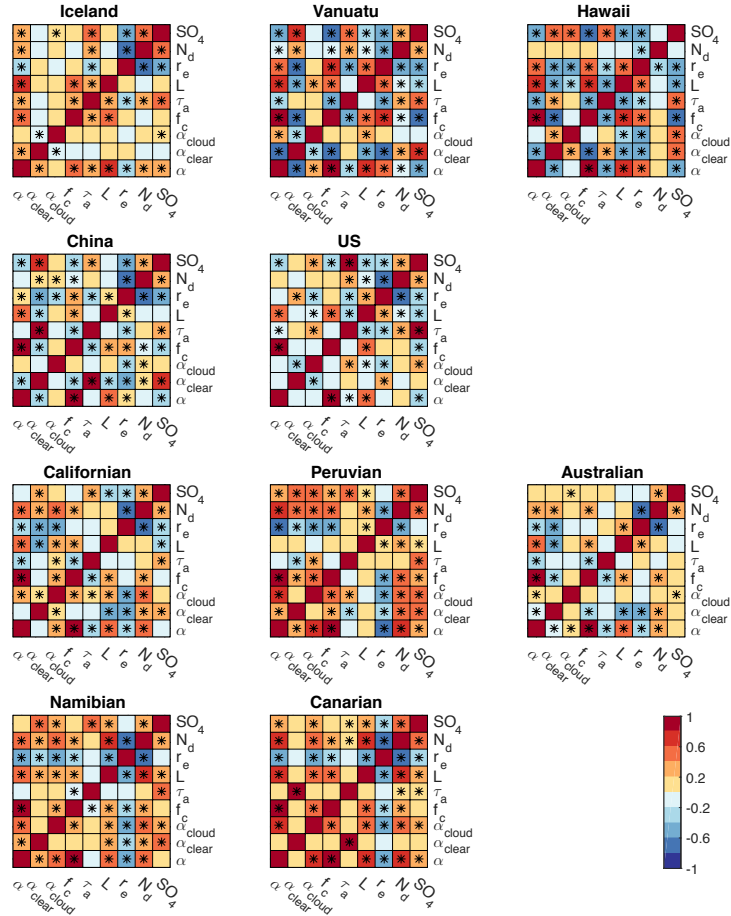


Figure S10: As in Figure S4 but for MRI-ESM1.

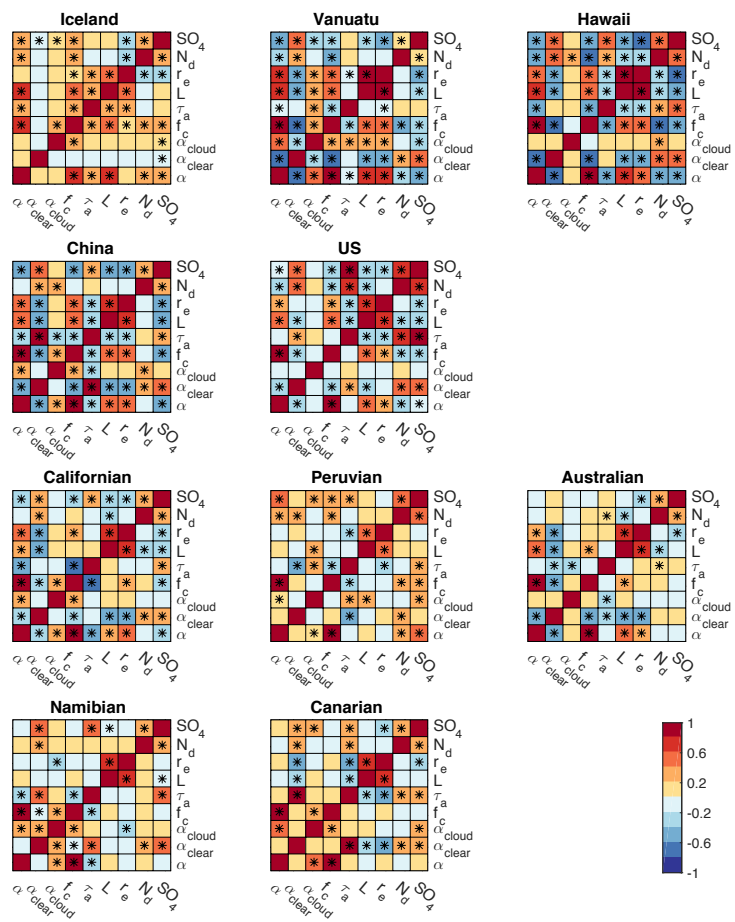


Figure S11: As in Figure S4 but for MRI-fixed.

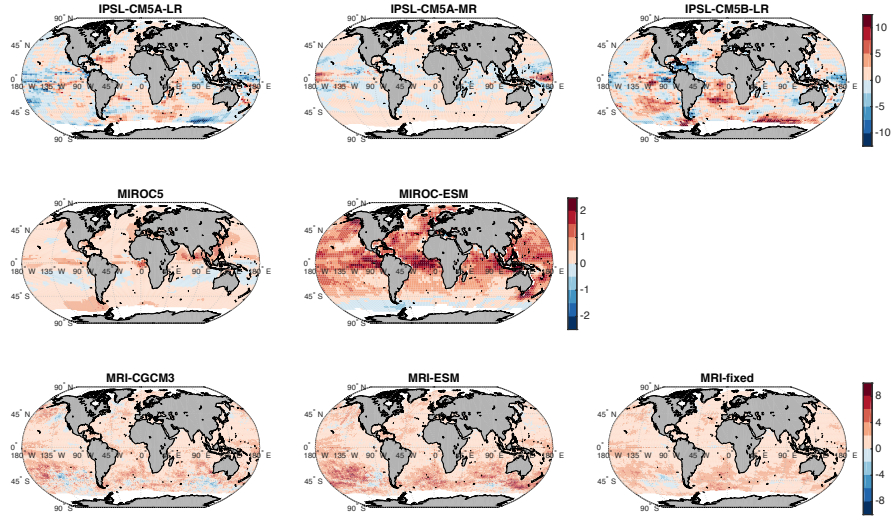


Figure S12: Spatial distribution of coefficient $d\log(N_a)/d\log(SO_4)$ for eight CMIP5 models. Note difference in colour scale between model groups.