Supporting information for…

Multi-model precipitation responses to removal of U.S. sulfur dioxide emissions

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Table 1: Region definitions

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| **Region (Abbr.)** | **Lon. range** | **Lat. range** |
| South Australia (S Aus) | 110E-180E | 50S-28S |
| North Australia (N Aus) | 110E-155E | 28S-10S |
| Central America (C Amer) | 115W-85W | 10N-30N |
| Western North America (W N Amer) | 130W-105W | 30N-60N |
| Central North America (C N Amer) | 105W-85W | 30N-50N |
| Eastern North America (E N Amer) | 85W-60W | 25N-50N |
| Alaska (Alaska) | 170W-105W | 60N-70N |
| Mediterranean Basin (Med) | 10W-40E | 30N-50N |
| Northern Europe (N Euro) | 10W-40E | 50N-75N |
| South Asia (S Asia) | 65E-100E | 5N-30N |
| Central Asia (C Asia) | 40E-75E | 30N-50N |
| North Asia (N Asia) | 40E-180E | 50N-70N |
| Arctic | 180W-180E | 60N-90N |
| Niño3.4 | 170W-120W | 5S-5N |
| Sahel | 20W-40E | 10N-20N |

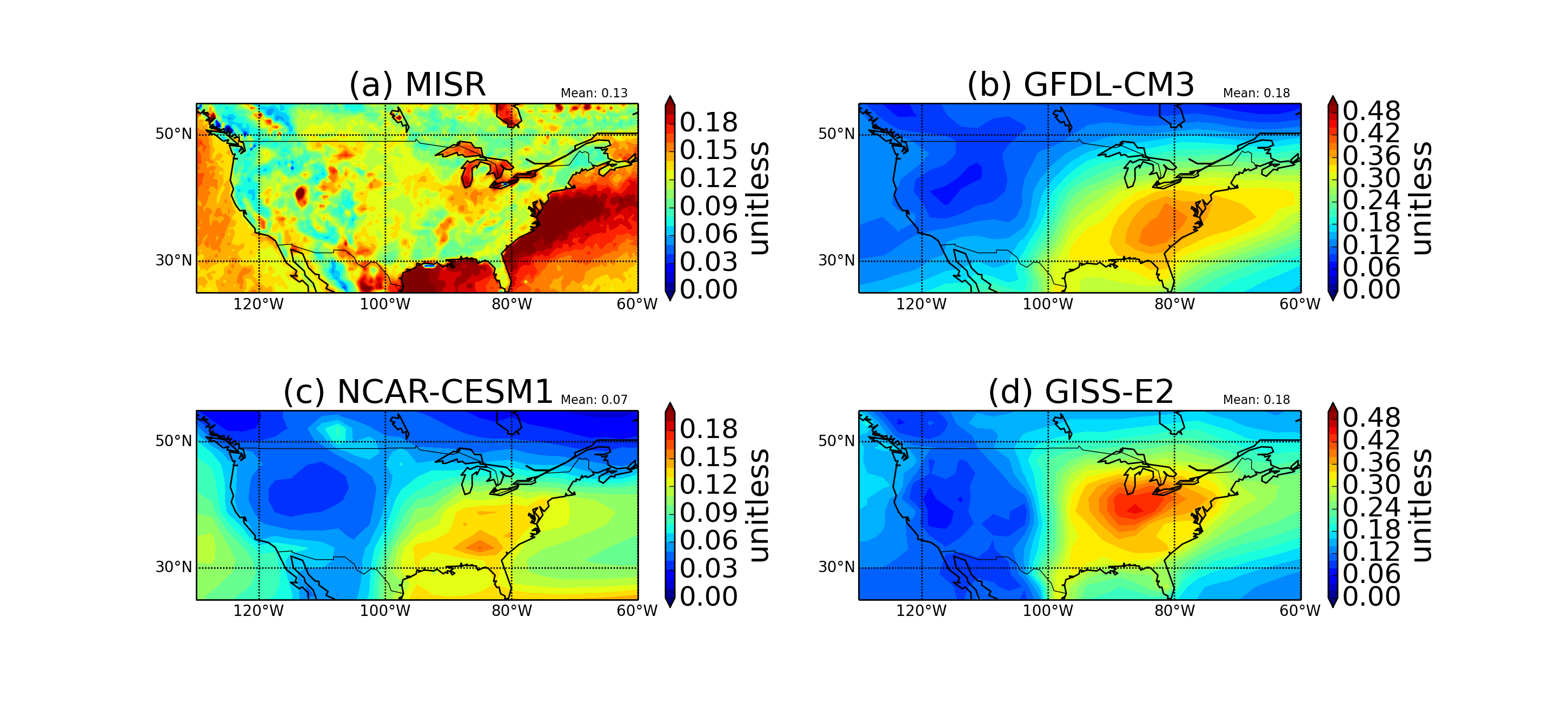


Figure 1: Annual mean all-sky AOD (550 nm) over the U.S. in (a) MISR (2001-2011 mean) and each of the three models: (b) GFDL-CM3, (c) NCAR-CESM1, and (d) GISS-E2. Note different scale for GFDL-CM3 and GISS-E2.

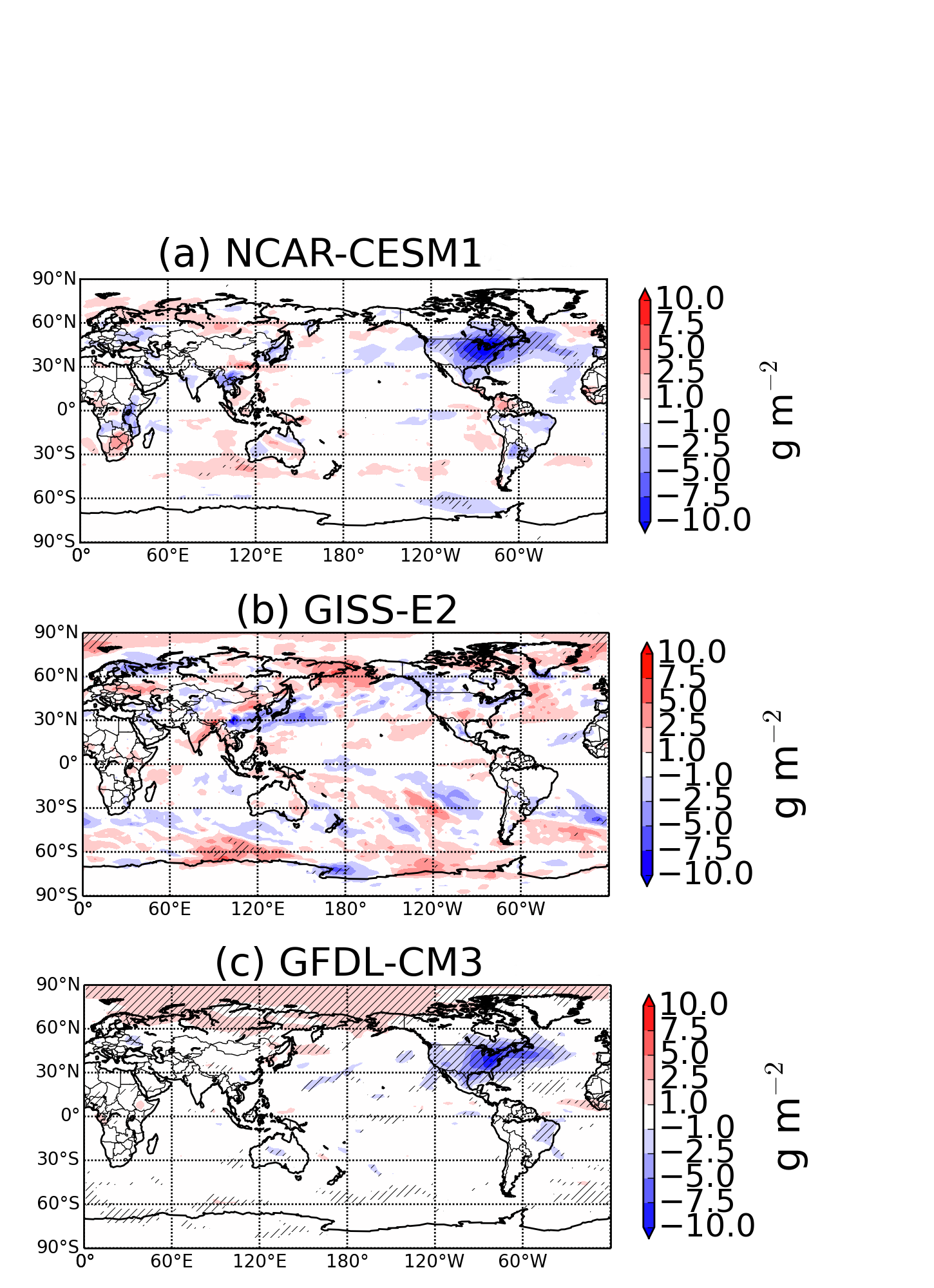


Figure 2: Response of global cloud liquid water path (LWP) to zero US SO2 emissions for (a) NCAR-CESM1, (b) GISS-E2, and (c) GFDL-CM3. Hatching represents statistical significance at the 95% confidence level

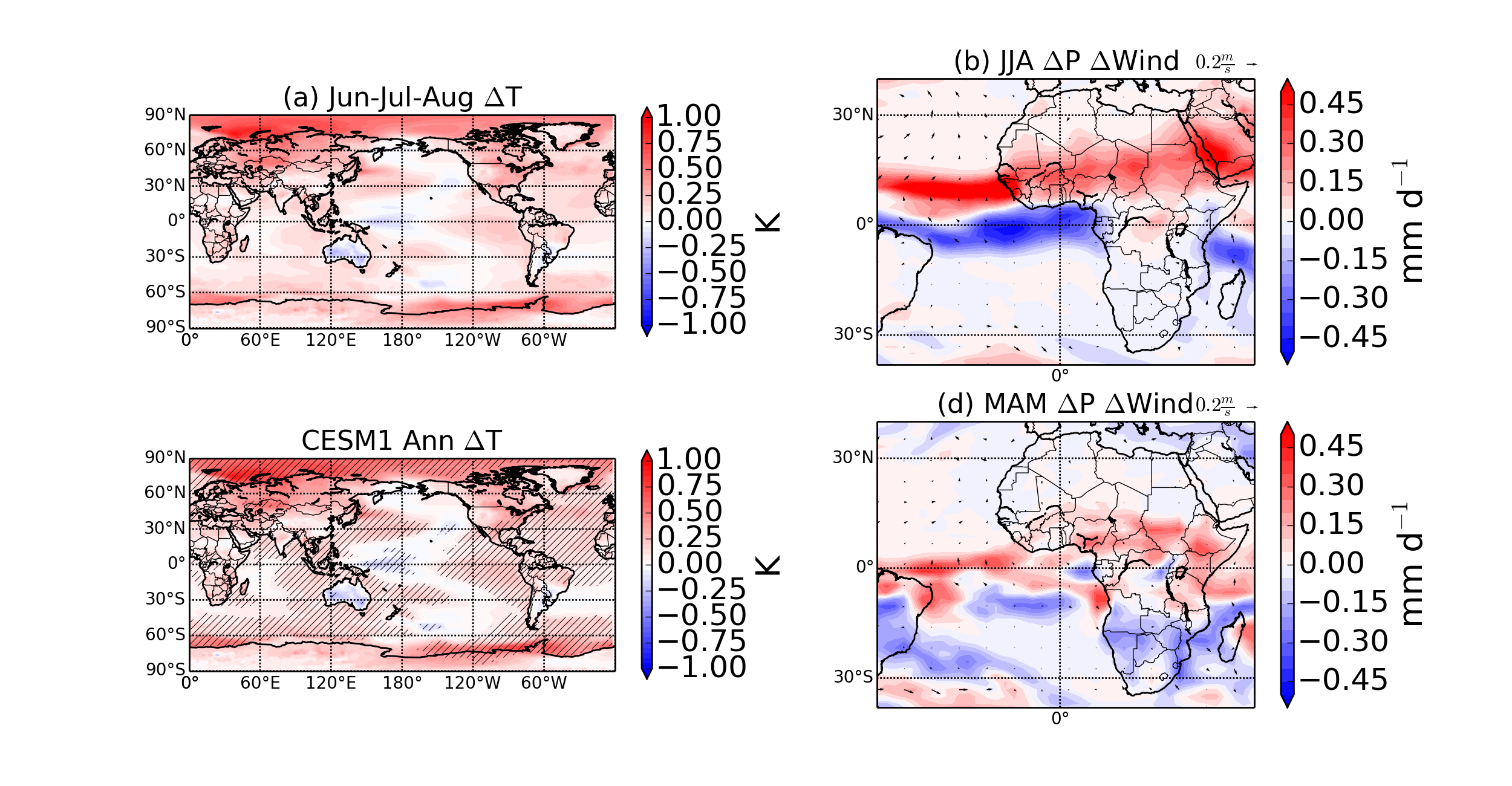


Figure 3: Annual mean surface temperature response to zero US SO2 emissions in CESM1. Hatching represents statistical significance at 95% confidence levels according to a Student’s t-test.

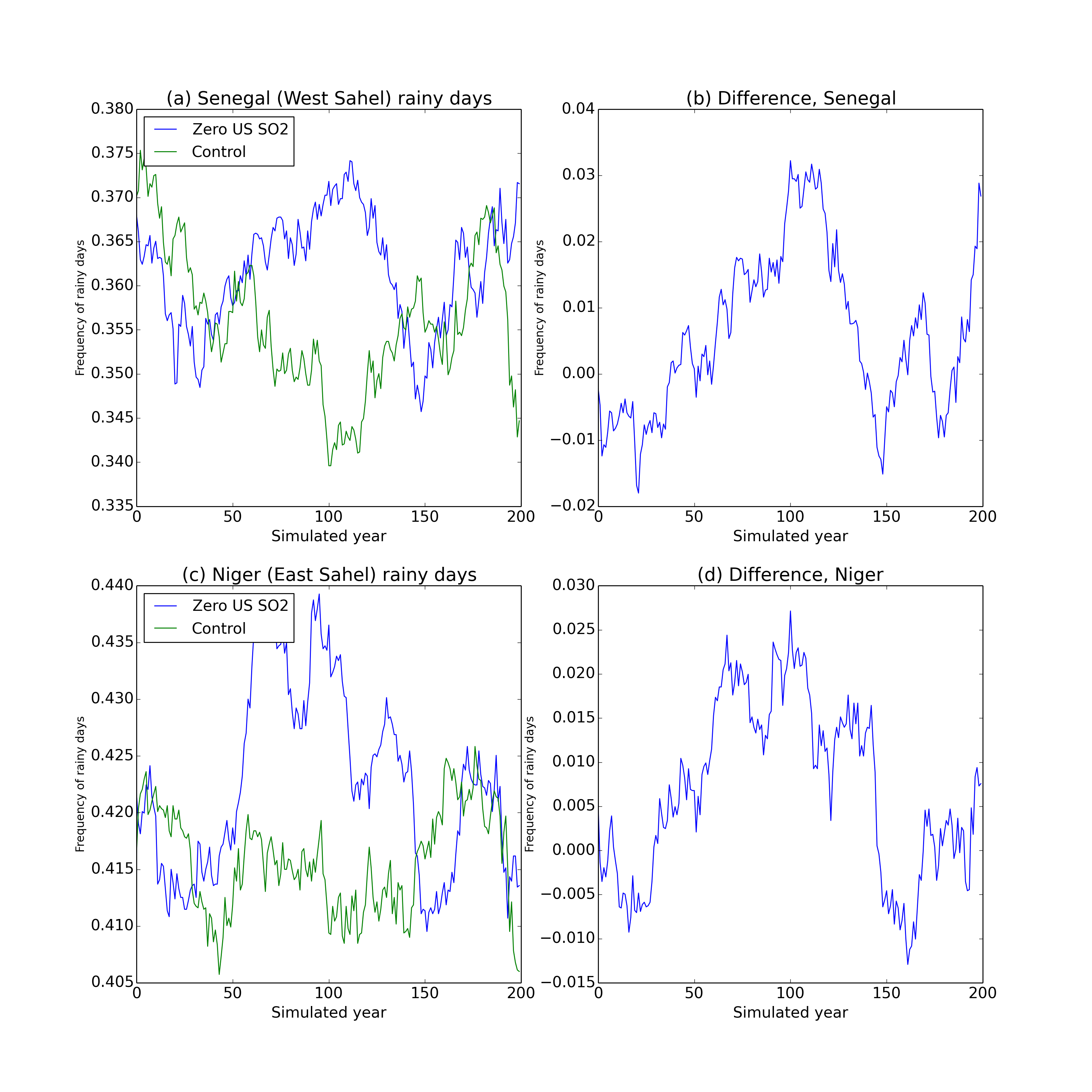


Figure 4: Frequency of rainy days in GFDL-CM3 in a given year in two Sahelian nations: (a) Senegal and (c) Niger. Differences between the perturbation run and control shown in (b) and (d) for each nation



Figure 5: (a) GISS-E2 JAS temperature difference between perturbation and control. (b) GISS-E2 JAS precipitation and wind difference between perturbation and control. (c) Same as (a), but for MAM. (d) Same as (b), but for MAM