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Northern Hemisphere stratospheric temperature response to external forcing in decadal climate simulations

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Supplementary information

Table S1. CMIP6 Model List

Model Name	Model Name	Model Name
1 AWI-CM-1-1-MR	10 EC-Earth3-Veg	19 CESM2-FV2
2 BCC-CSM2-MR	11 IPSL-CM6A-LR	20 CESM2-WACCM
3 BCC-ESM1	12 MIROC-ES2L	21 CESM2-WACCM-FV2
4 CAMS-CSM1-0	13 MIROC6	22 NorESM2-LM
5 FGOALS-g3	14 HadGEM3-GC31-LL	23 GFDL-CM4
6 CanESM5	15 UKESM1-0-LL	24 GFDL-ESM4
7 CNRM-CM6-1	16 MRI-ESM2-0	25 NESM3
8 CNRM-ESM2-1	17 GISS-E2-1-G	26 SAM0-UNICON
9 E3SM-1-0	18 GISS-E2-1-H	27 MCM-UA-1-0

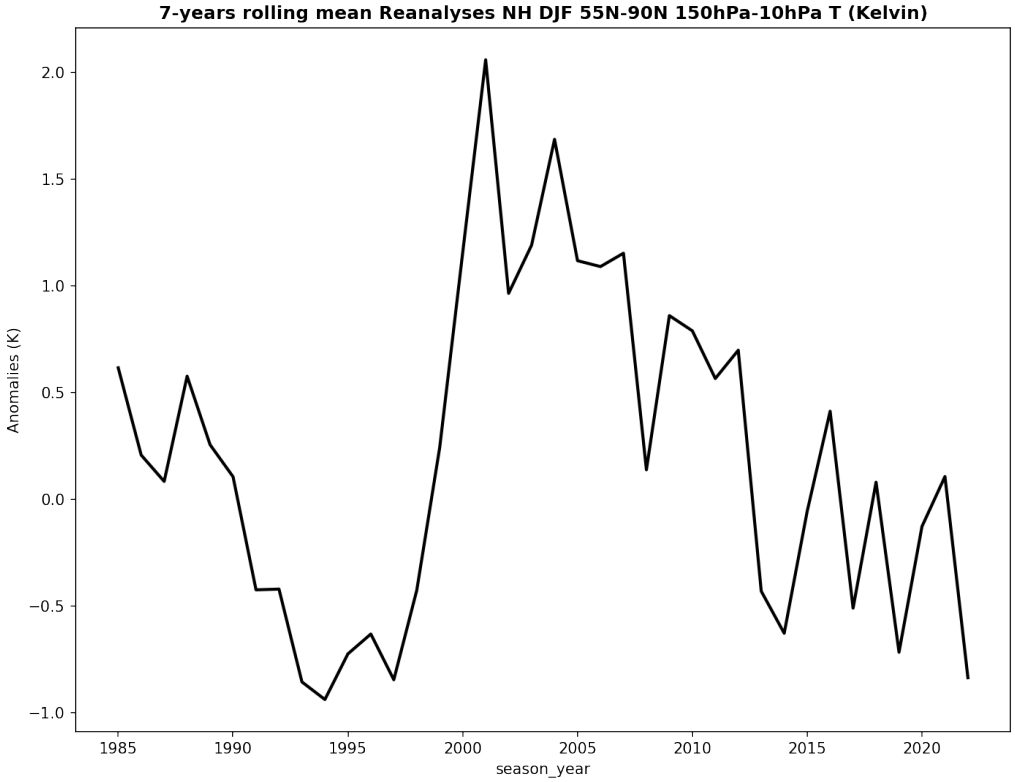

Figure S1. Rolling mean T from reanalysis

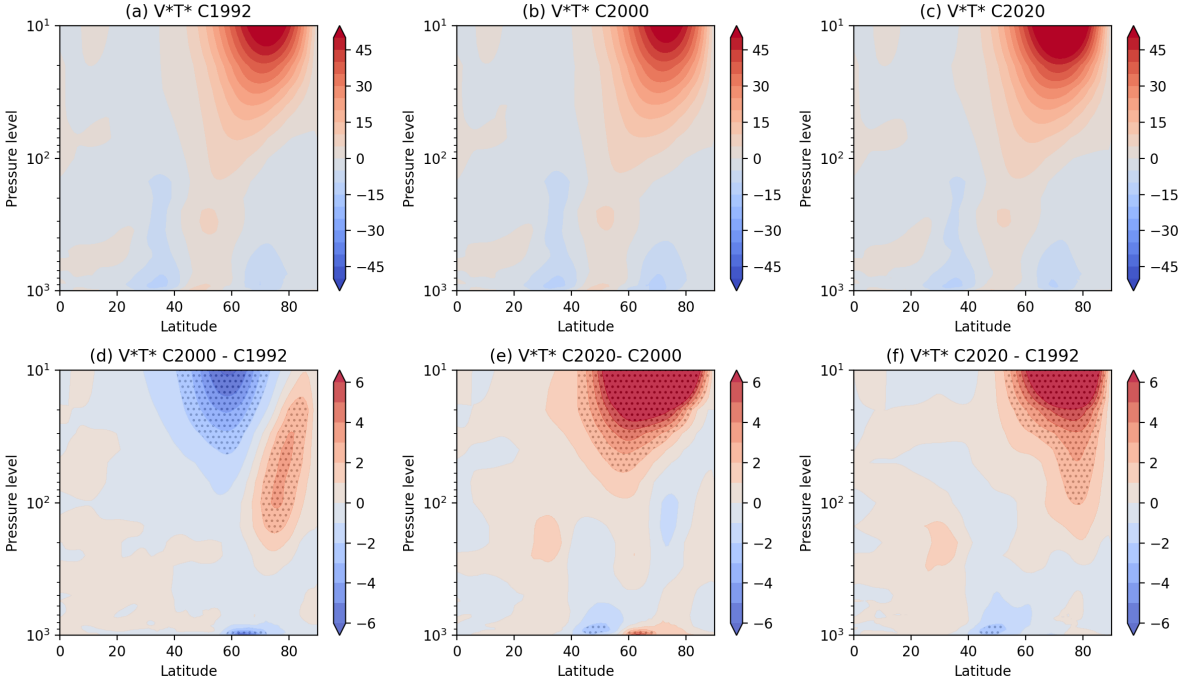

Figure S2. Zonal Mean NH DJF V^*T^* mean for (a) P1992, (b) P2000, (c) P2020, and (d) difference between P2000 - P1992, (e) difference between P2020 - P2000, (f) difference between P2020 - P1992. Figures are stippled at 95% significance computed using a difference of means 2-sided t-test from 30-member ensemble sample.

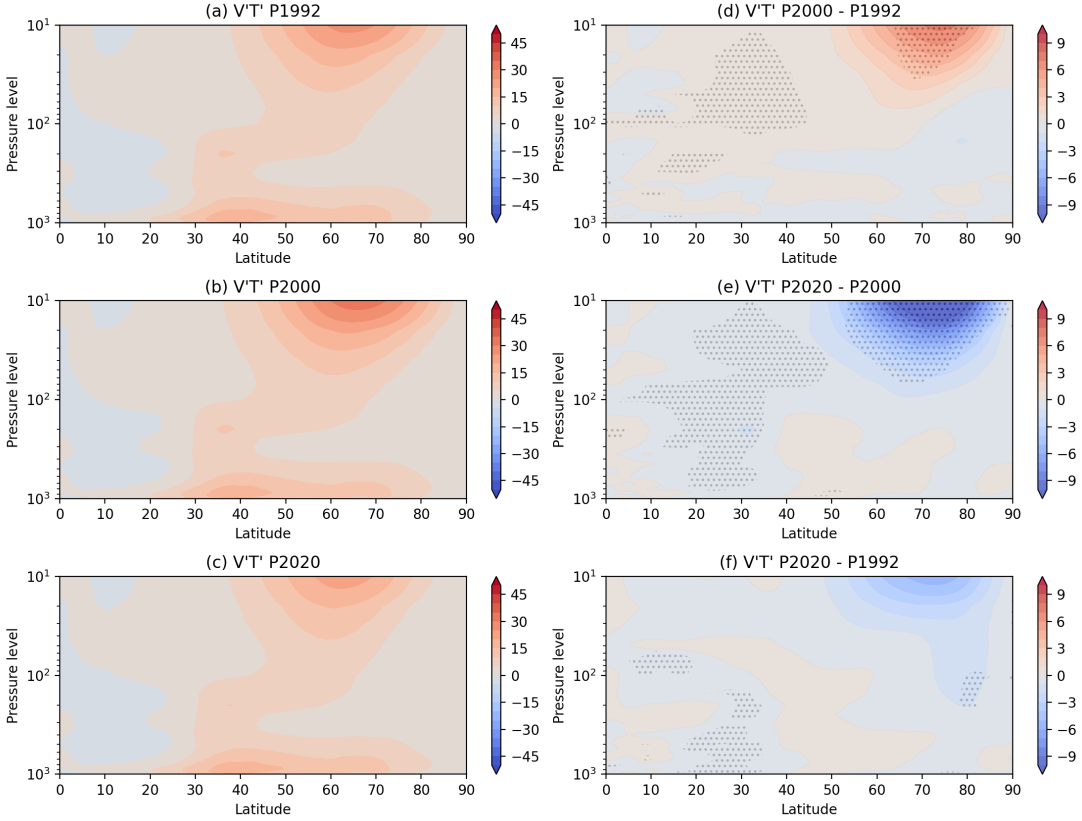

Figure S3. Zonal Mean NH DJF V'T' mean for (a) P1992, (b) P2000, (c) P2020, and (d) difference between P2000 - P1992, (e) difference between P2020 - P2000, (f) difference between P2020 - P1992. Figures are stippled at 95% significance computed using a difference of means 2-sided t-test from 30-member ensemble sample.

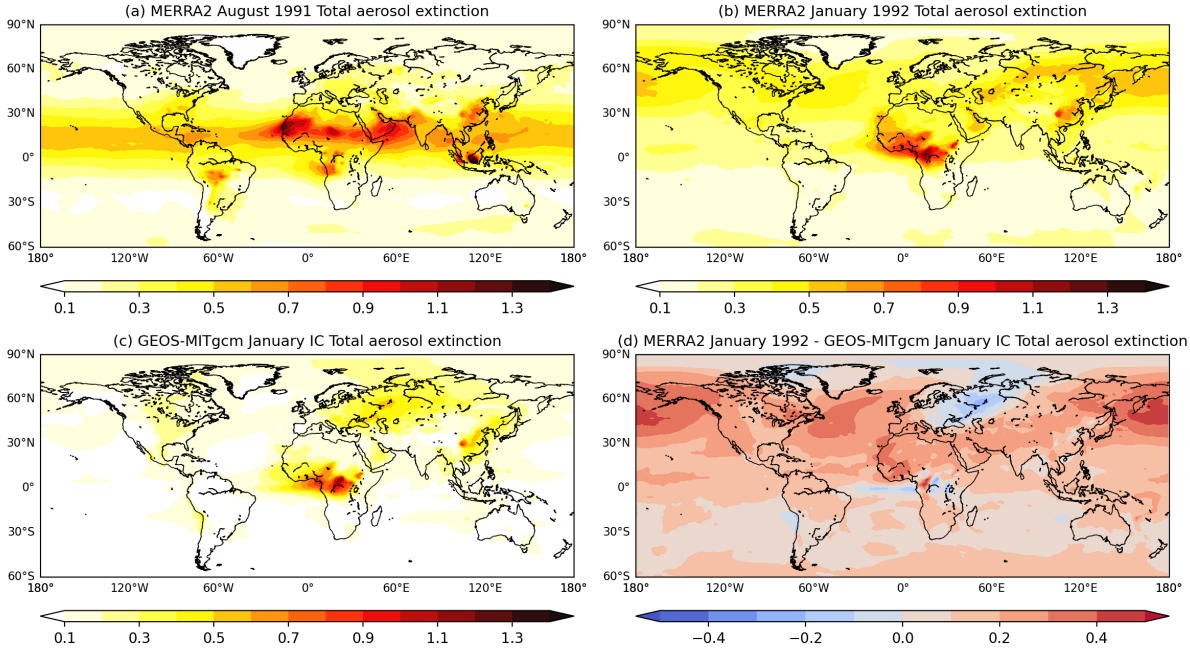

Figure S4. Total monthly mean aerosol extinction Aerosol Optical Depth [550 nm] for (a) MERRA2 August 1991, (b) MERRA2 January 1992, (c) GEOS-MITgcm January initial condition, which is used or more spun-up from this initial condition was used to initialize all experiments, and (d) MERRA2 January 1992 - GEOS-MITgcm January initial condition. The volcanic aerosol from Mount Pinatubo is visible in the MERRA2 August 1991 aerosol extinction in plot (a) (15°N, 120°E). The GEOS-MITgcm January initial condition is significantly different from observed state compared to the MERRA2 shown in plot (d), where any volcanic aerosol is not present.