Atmospheric
Chemistry
and Physics
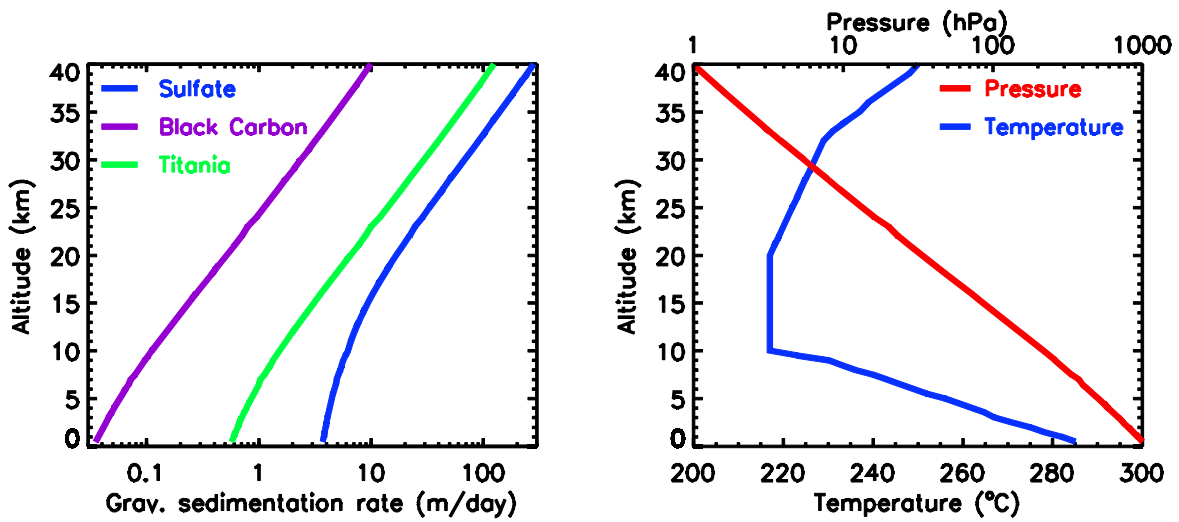Discussions

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Supplement of

Climatic impacts of stratospheric geoengineering with sulfate, black carbon and titania injection

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3   **Fig. S1** *(left) Gravitational sedimentation rates for sulfate, titania and black carbon,*
4   *calculated using densities of 1769, 4230 and 1000 kg/m³ respectively, the mass-weighted*
5   *radii of the specified log-normal distributions and the method of Pruppacher & Klett (1979)*
6   *(right) We use the International Standard Atmosphere (ICAO, 1993) for temperature and*
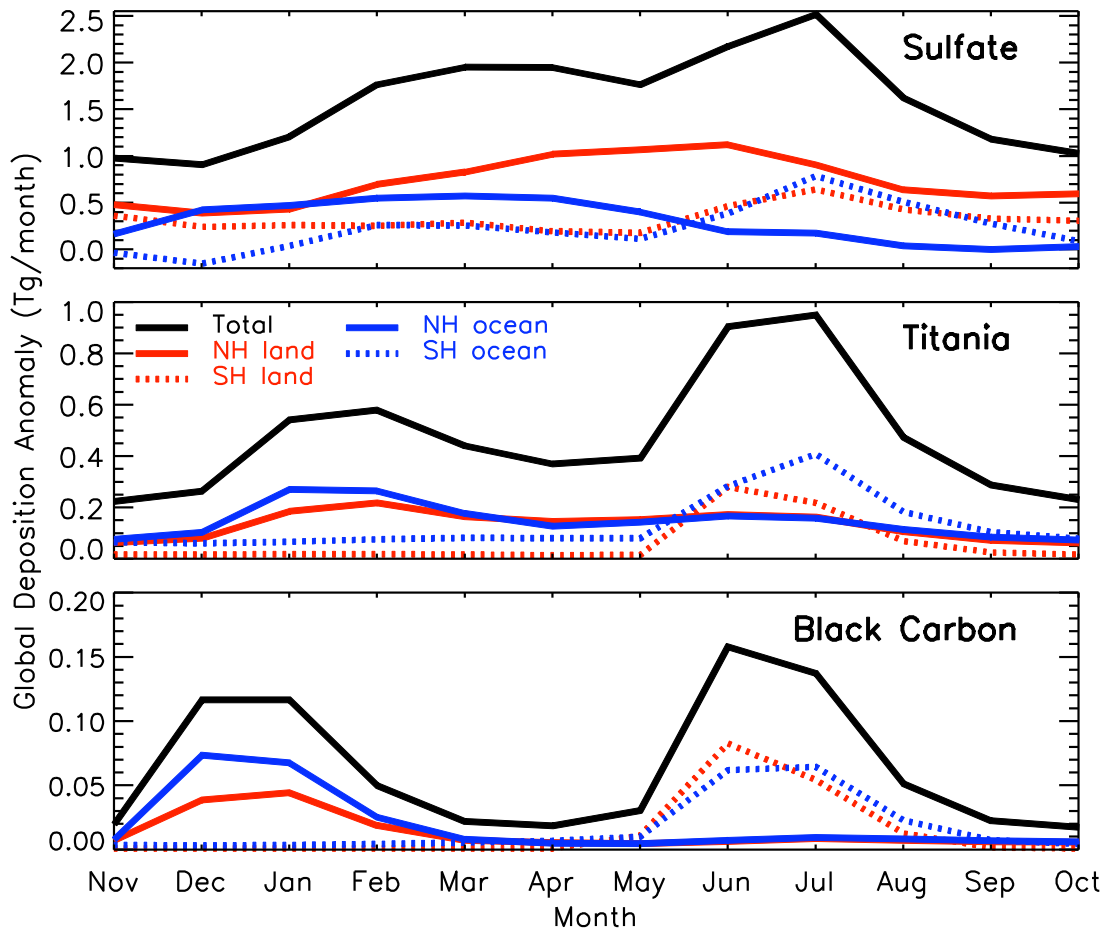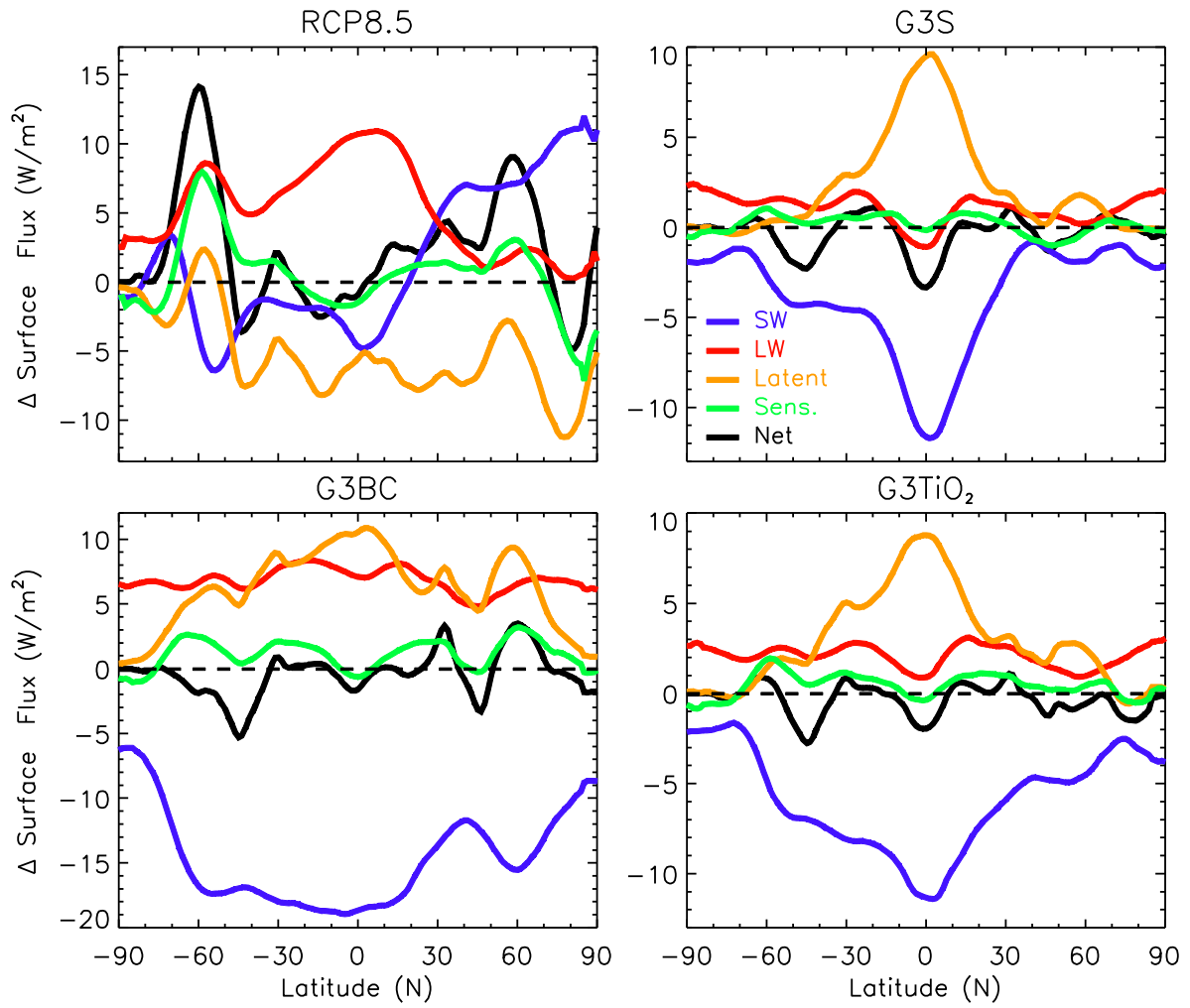7   *pressure as a function of altitude*

8
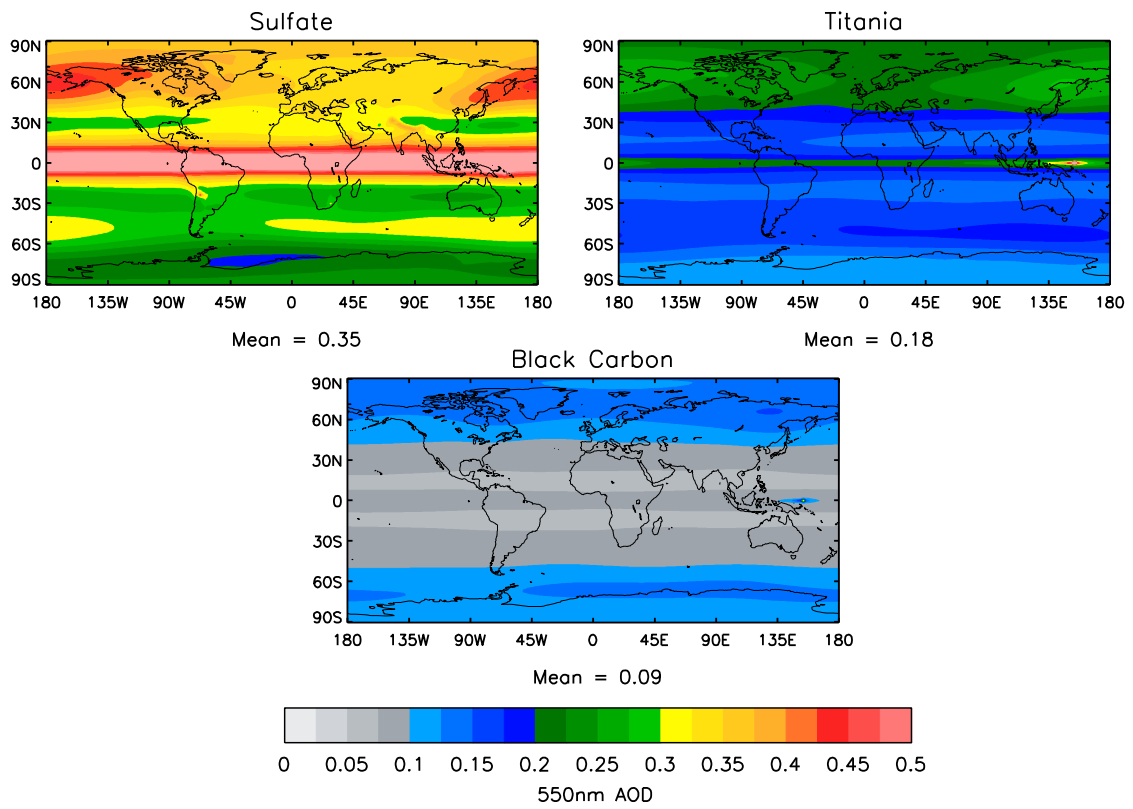
Fig. S2 *Annual-mean 550nm optical depth anomaly for sulfate (G3S), titania (G3TiO$_2$) and black carbon (G3BC)*

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2   **Fig. S3** *Seasonal cycle of global/monthly-total aerosol deposition anomaly*
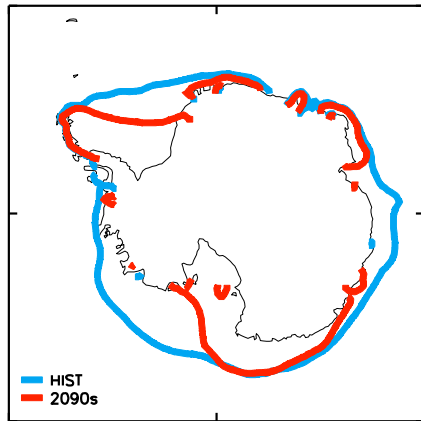
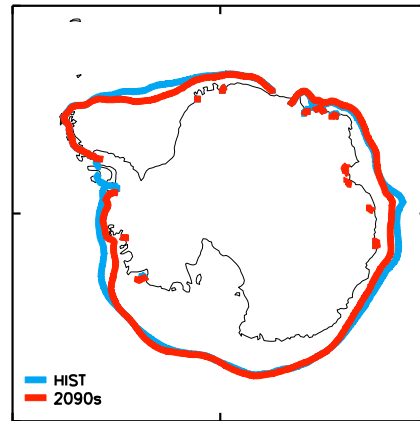**Fig. S4** *Annual/zonal-mean energy flux anomaly at the surface (W/m²)*
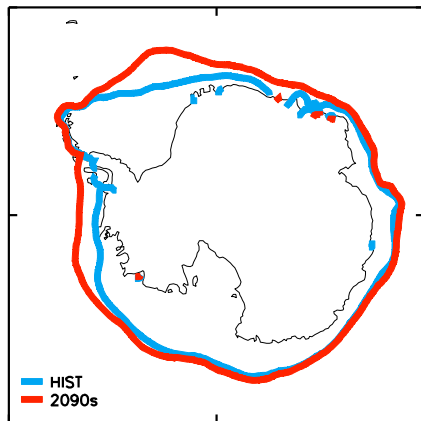
a) RCP8.5: Sea−Ice DJF

b) G3S: Sea−Ice DJF

c) G3BC: Sea−Ice DJF

d) G3TiO₂: Sea−Ice DJF

HIST
2090s

Δ = −2.18 million km²
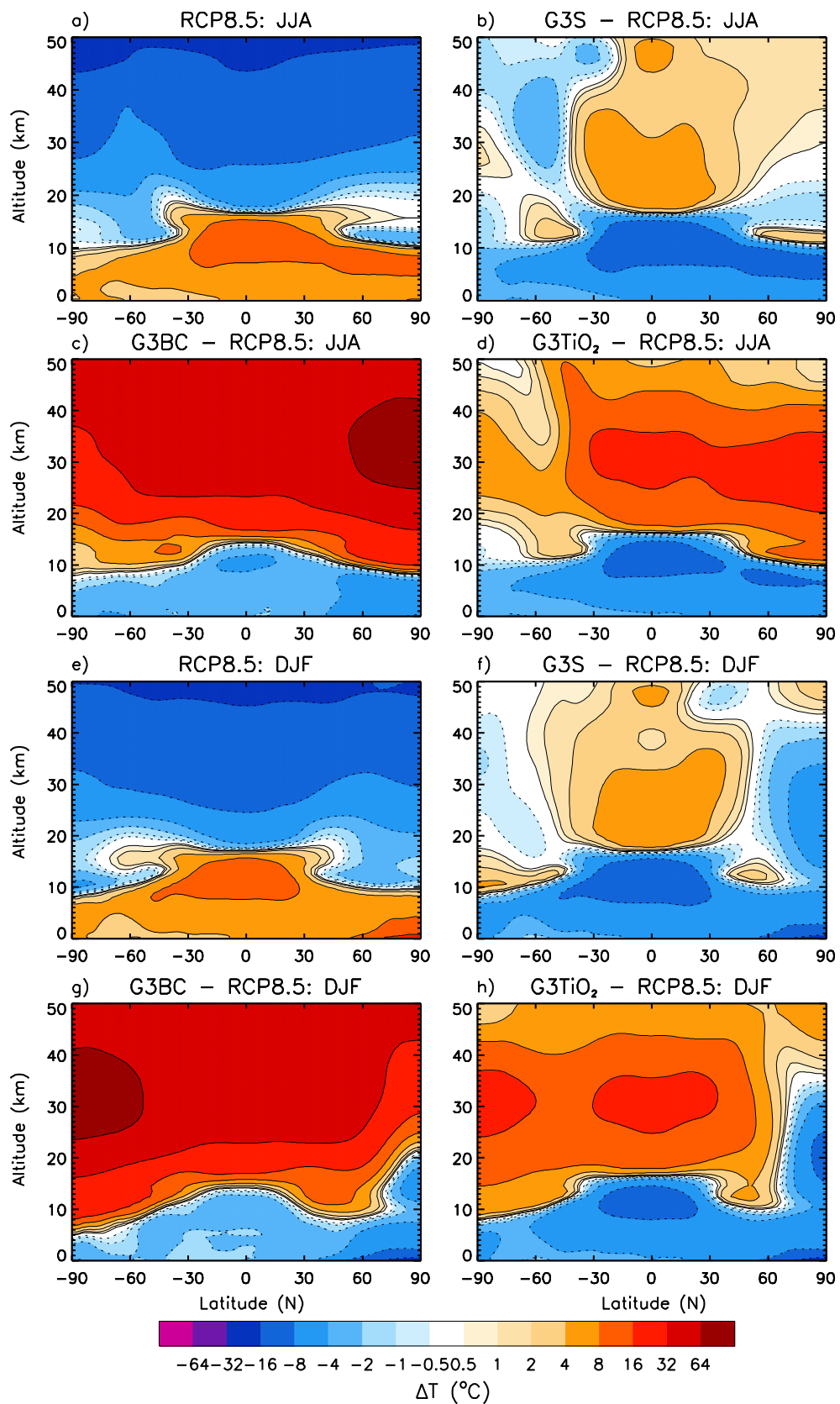
Δ = −0.40 million km²
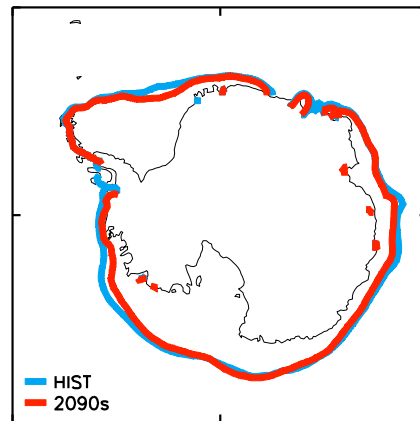
Δ = +1.64 million km²

Δ = −0.47 million km²

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2   **Fig. S5** *DJF southern-hemisphere sea-ice edge plotted with the HIST extent*
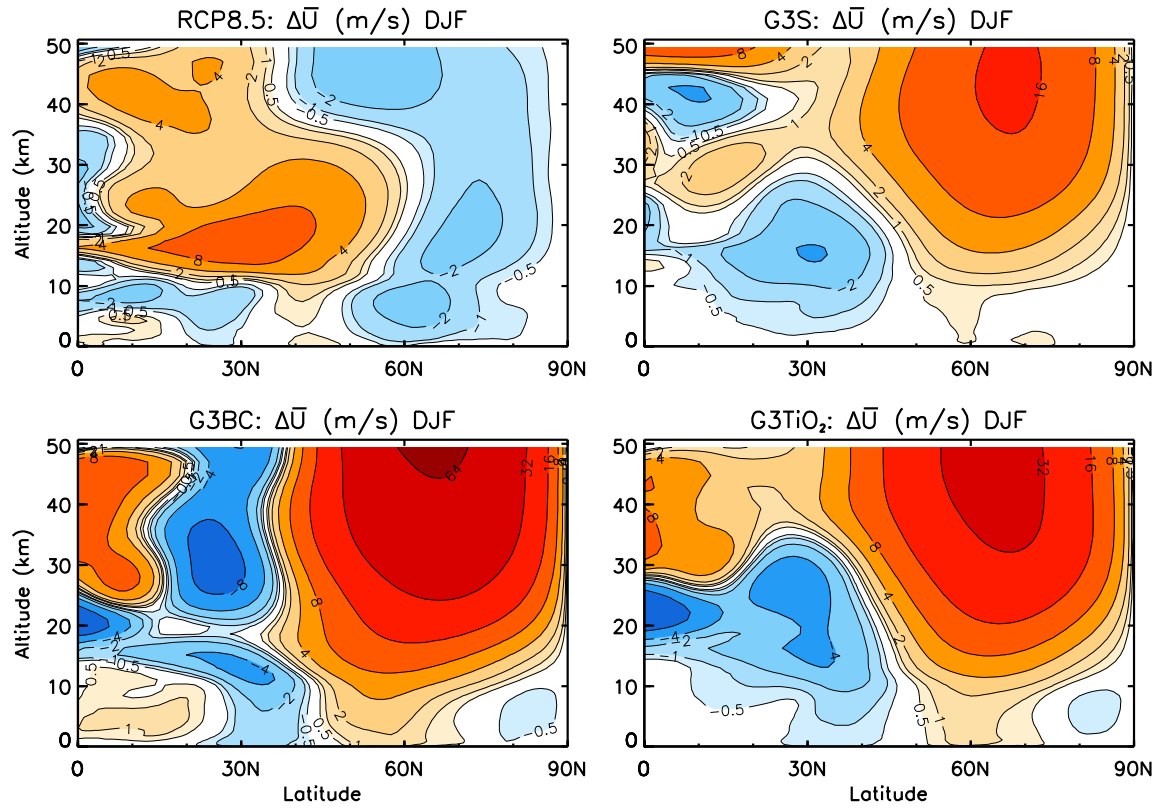
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Fig. S6 *JJA (top) and DJF (bottom) zonal-mean temperature anomaly with altitude, with respect to the HIST temperature profile for RCP8.5 (a,e), and with respect to RCP8.5 for G3S, G3BC and G3TiO$_2$*
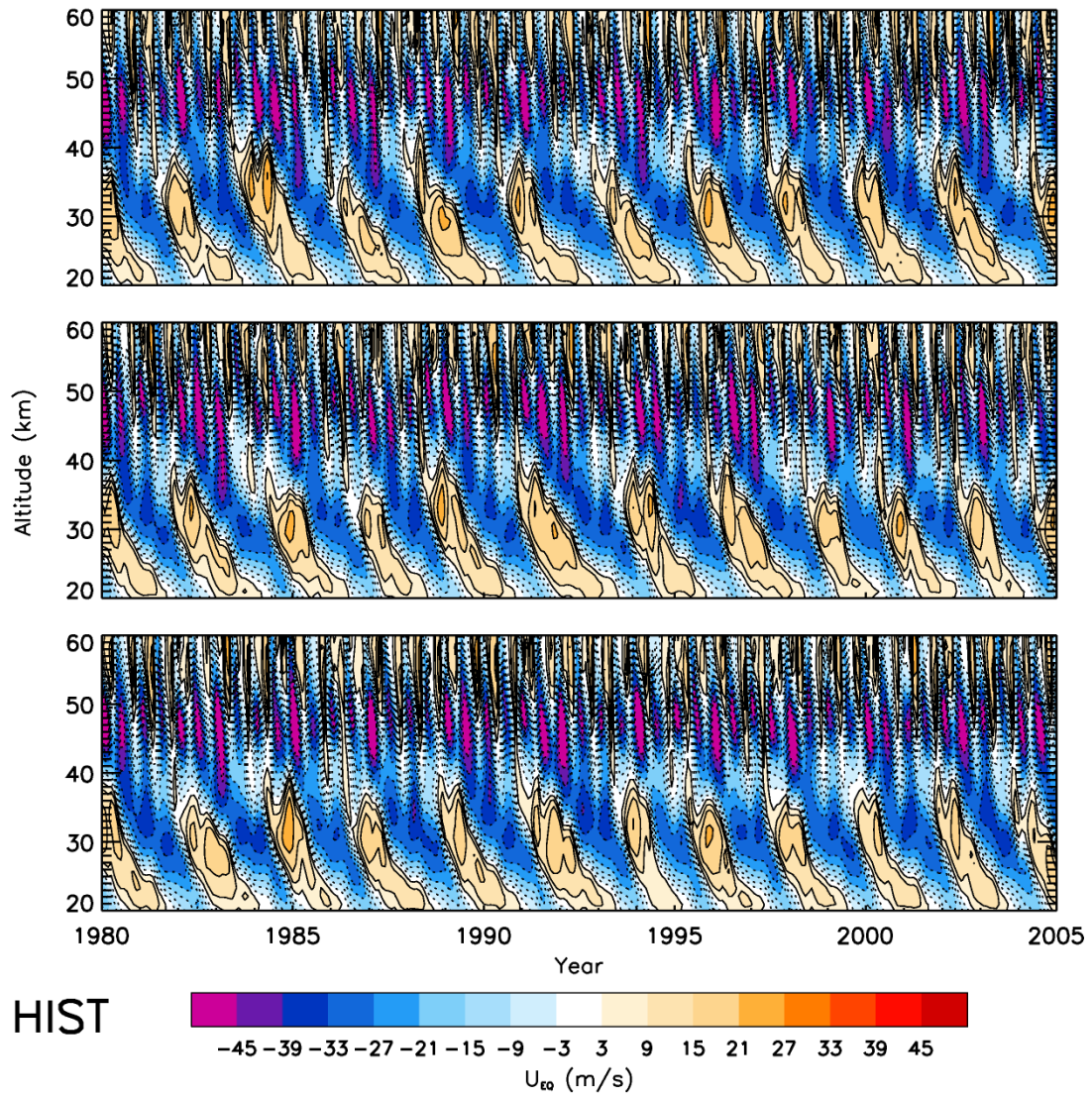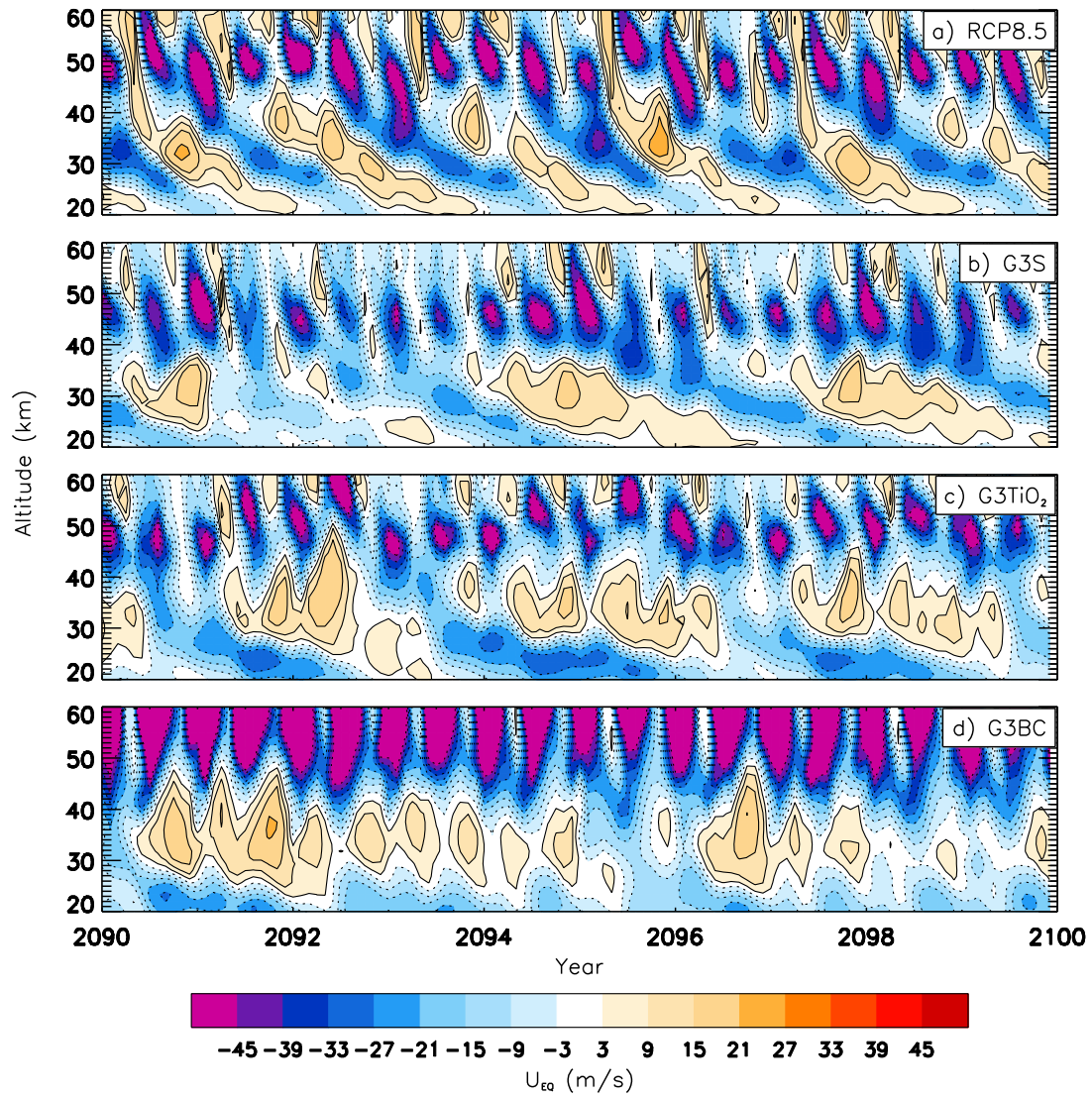
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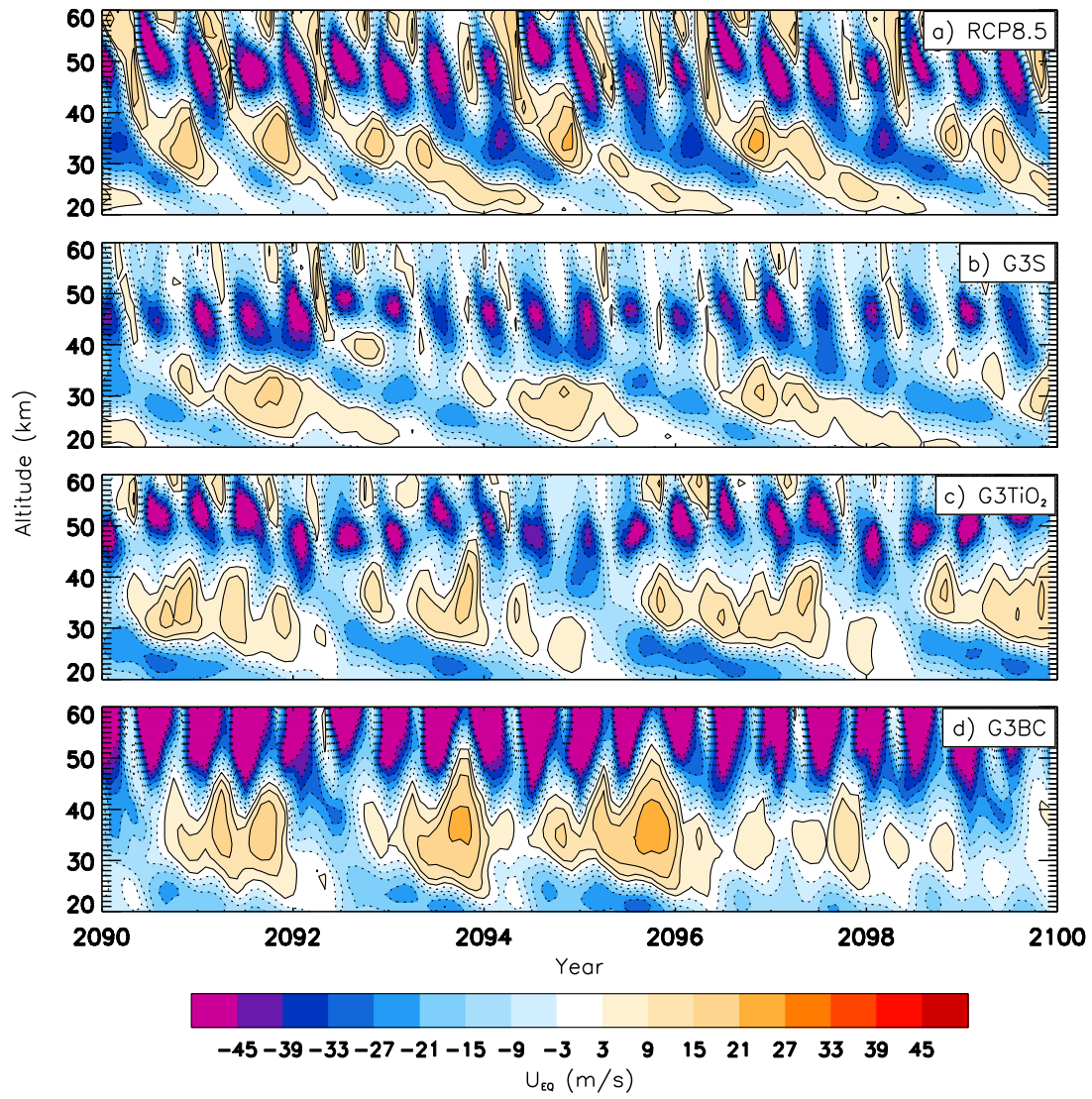2   **Fig. S7** *DJF zonal-mean zonal wind anomaly with respect to HIST*

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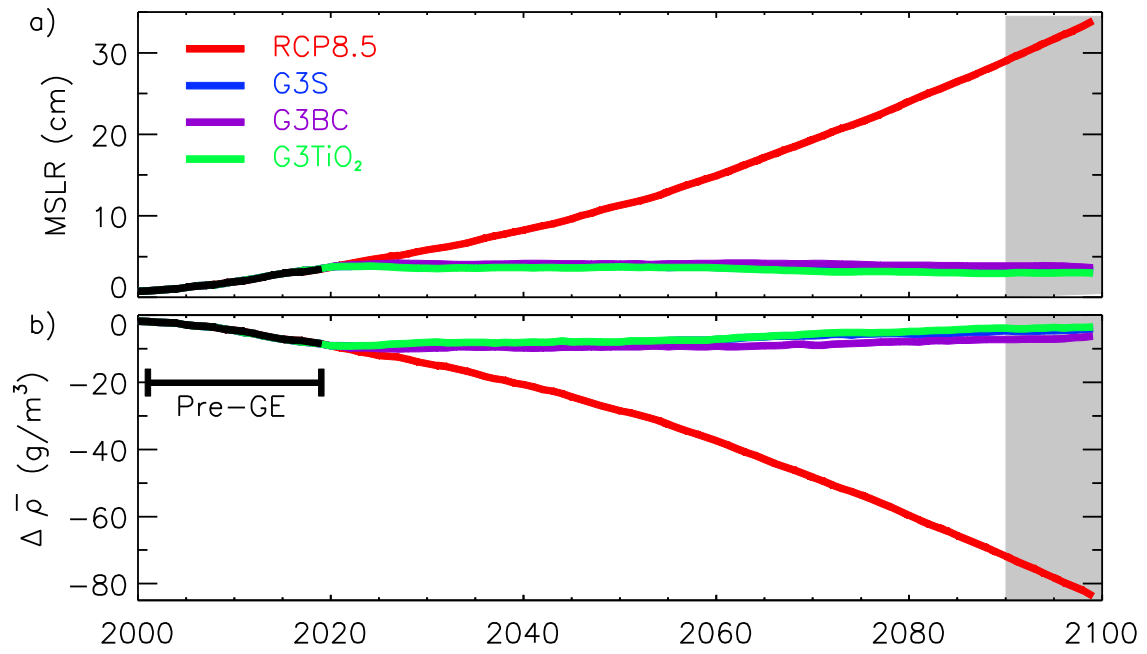Fig. S8 *Timeseries of equatorial (5^oS-5^oN) zonal-mean zonal wind profile (HIST - 3 ensemble members)*

Fig. S9a *Timeseries of equatorial (5°S-5°N) zonal-mean zonal wind profile (2nd ensemble member)*

Fig. S9b *Timeseries of equatorial (5°S-5°N) zonal-mean zonal wind profile (3rd ensemble member)*

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2   **Fig. S10** *Timeseries of global thermosteric sea-level rise, calculated using changes in*
3   *oceanic temperature and salinity. (Top) Global mean thermosteric sea-level rise (bottom)*
4   *Global mean oceanic density anomaly*