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Supplement of

Shortwave radiative forcing, rapid adjustment, and feedback to the surface by sulfate geoengineering: analysis of the Geoengineering Model Intercomparison Project G4 scenario

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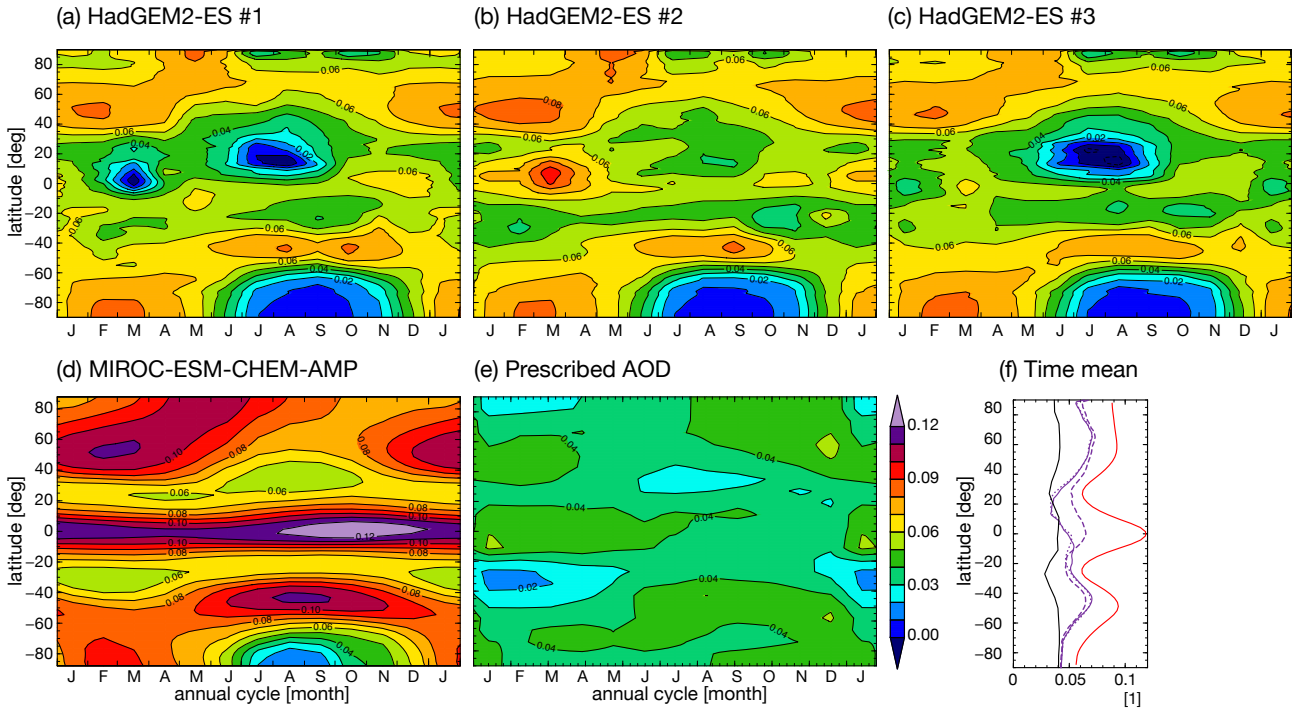

Figure S1. Annual cycle of stratospheric sulphate AOD averaged zonally and temporally over 2040–2069 for (a–c) each run of HadGEM2-ES and (d) MIROC-ESM-CHEM-AMP, (e) the prescribed AOD with same color shading, and (f) latitudinal distribution of the temporal means, where #1, #2, and #3 of HadGEM2-ES are shown by solid, dashed, and dotted purple lines, respectively, MIROC-ESM-CHEM-AMP by red line, and the prescribed AOD by black line. Note that HadGEM2-ES's AOD is approximately obtained by subtraction of sulphate aerosol AOD for both stratosphere and troposphere in G4 from that in RCP4.5.

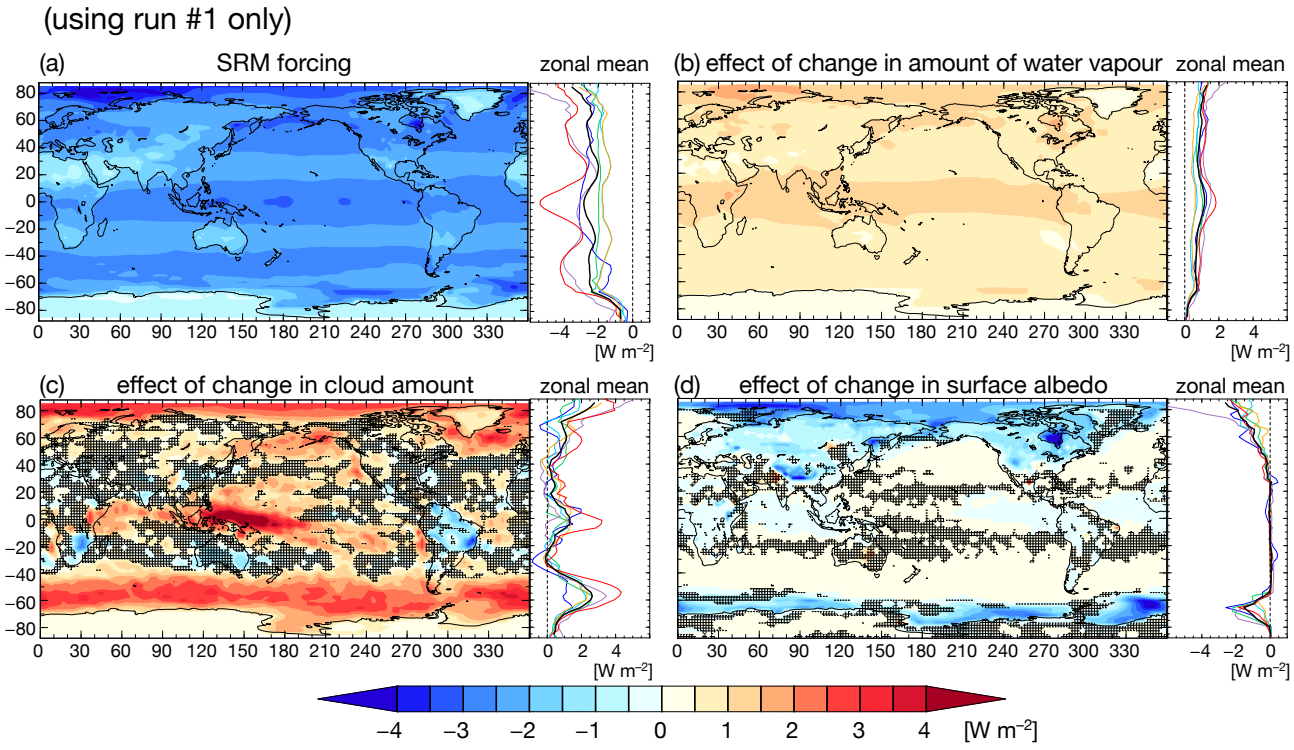

Figure S2. Same as Fig. 9 but using one run for each model.

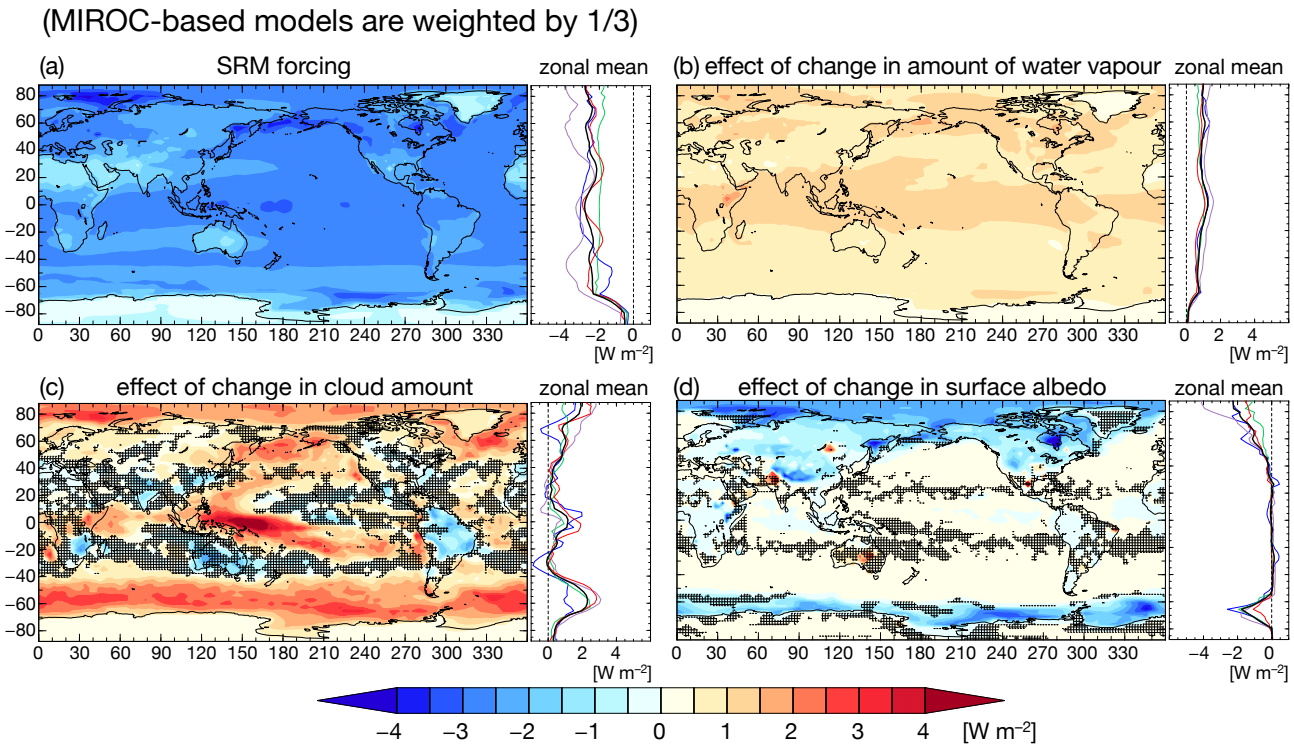

Figure S3. Same as Fig. 9 but the three MIROC-based models are weighted by 1/3 for the multi-model means and red lines indicate the means of the three MIROC-based models.

Table S1. Same as Table 3 but for values at TOA.

Models	$Q_{\mathrm{WV}}^{\mathrm{TOA}}$	$-P_{\mathrm{WV}}^{\mathrm{TOA}}$	$\mathrm{R}_{\mathrm{WV}}^{\mathrm{TOA}}$	$Q_{\mathrm{C}}^{\mathrm{TOA}}$	$-P_{\mathrm{C}}^{\mathrm{TOA}}$	$\mathrm{R}_{\mathrm{C}}^{\mathrm{TOA}}$	$Q_{\mathrm{SA}}^{\mathrm{TOA}}$	$-P_{\mathrm{SA}}^{\mathrm{TOA}}$	$\mathrm{R}_{\mathrm{SA}}^{\mathrm{TOA}}$
BNU-ESM	1.4×10^{-2}	0.15	0.87	0.80	-0.01	-0.01	-3.1×10^{-2}	0.21	0.51
CanESM2	3.9×10^{-2}	0.12	0.63	0.56	-0.32	-0.18	-6.2×10^{-3}	0.22	0.63
HadGEM2-ES	-2.5×10^{-2}	0.14	0.90	1.28	0.36	0.32	1.4×10^{-3}	0.17	0.70
MIROC-ESM	1.2×10^{-2}	0.17	0.75	1.05	1.17	0.31	4.0×10^{-4}	0.37	0.52
MIROC-ESM-CHEM	-2.2×10^{-2}	0.14	0.85	0.73	-0.03	-0.02	6.3×10^{-4}	0.31	0.74
MIROC-ESM-CHEM-AMP	-3.7×10^{-2}	0.15	0.81	1.98	0.58	0.29	2.8×10^{-2}	0.32	0.67
Multi-model mean	-3.2×10^{-3}	0.15	0.80	1.07	0.29	0.12	-1.1×10^{-3}	0.27	0.63