Supplement to:

Stratospheric ozone projections under sulfur-based stratospheric aerosol injection: Insights from the multi-model G6-SAI-1.5K experiment

by Bednarz et al. (2026)

	CESM	MIROC	UKESM
$N_2O_5 + H_2O \rightarrow 2\ HNO_3$	X	X	X
$ClONO_2 + H_2O \rightarrow HOCl + HNO_3$	X	X	X
$ClONO_2 + HCl \rightarrow Cl + Cl + HNO_3$	X	X	X
$N_2O_5 + HCl \rightarrow Cl + NO_2 + HNO_3$		X	
$HOCl + HCl \rightarrow Cl + Cl + H_2O$	X	X	X
$HOBr + HBr \rightarrow Br + Br + H_2O$		X	
$HOBr + HCl \rightarrow BrCl + H_2O$	X	X	
$HOCl + HBr \rightarrow BrCl + H_2O$		X	
$BrONO_2 + HBr \rightarrow Br + Br + HNO_3$		X	
$BrONO_2 + HCl \rightarrow BrCl + HNO_3$		X	X
$ClONO_2 + HBr \rightarrow BrCl + HNO_3$		X	
$BrONO_2 + H_2O \rightarrow HOBr + HNO_3$	X	X	X
$N_2O_5 + HBr \rightarrow Br + NO_2 + HNO_3$		X	

Table S1. Summary of the heterogenous reactions occurring in each model on stratospheric sulfate aerosols.

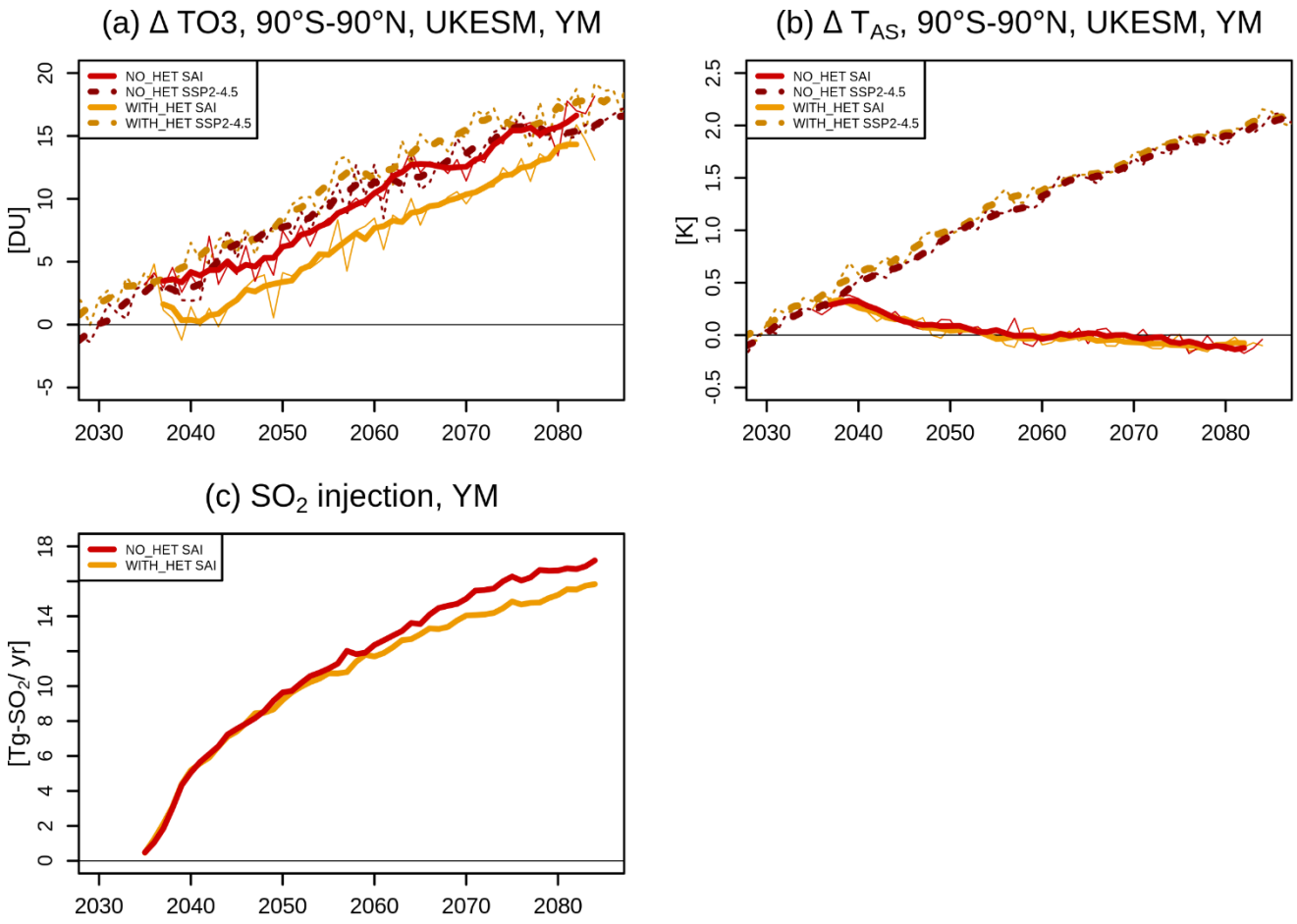

Figure S1. Timeseries of ensemble mean changes in annual mean ('YM') global mean (a) total column ozone and (b) near-surface air temperature (T_{AS}) in the UKESM G6-SAI-1.5K (solid) or SSP2-4.5 experiment (dashed). Orange lines are for the fully coupled simulations with heterogenous chemistry on SAI aerosols included (WITH_HET, as discussed in this paper), and red lines are for the sensitivity simulation without it (NO_HET, i.e. the original UKESM simulations discussed in Lee et al. 2025). In both cases, the changes are calculated relative to the same baseline, i.e. 2020-2039 ensemble mean of the SSP2-4.5 NO_HET simulation. Thin lines denote the ensemble mean changes and thick lines denote their 5-year running means. (c) Timeseries of the corresponding ensemble mean annual mean SO_2 injection rates in the G6-1.5K-SAI simulation (colors).

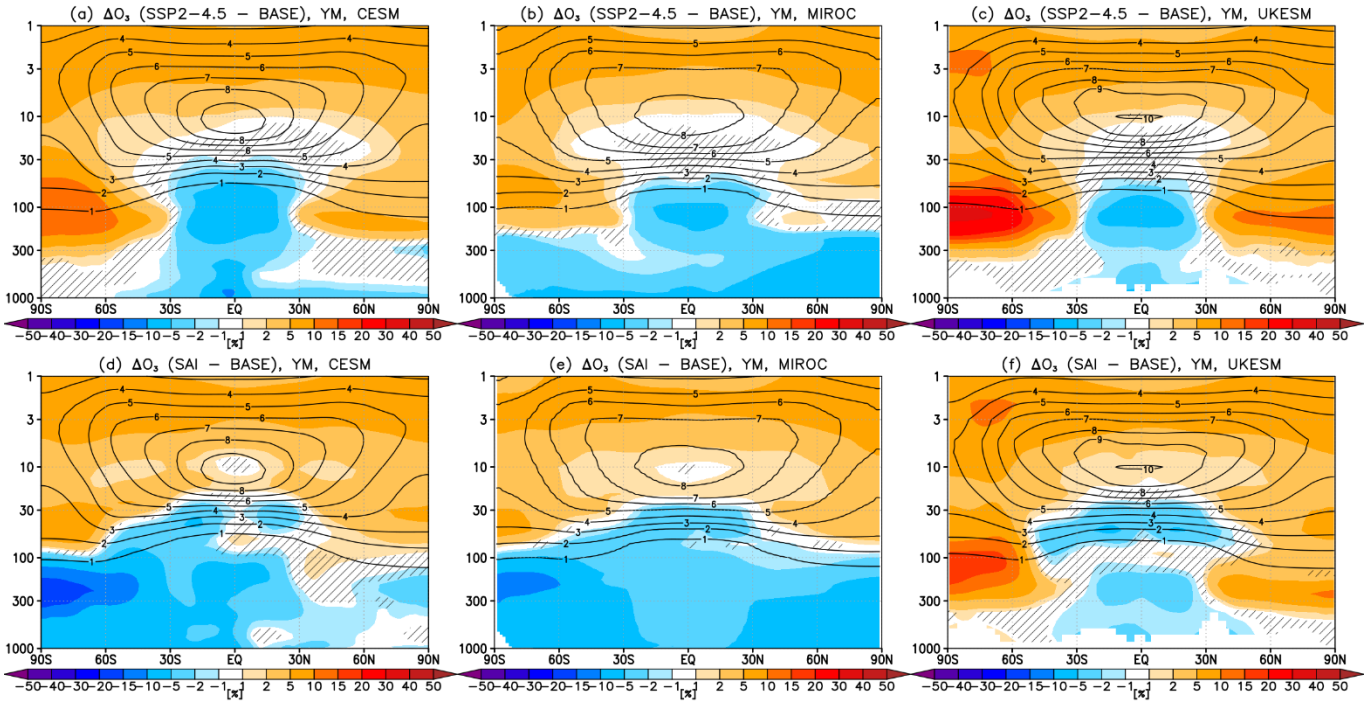

Figure S2. Shading: Annual mean 2045-2064 changes in ozone volume mixing ratios in each model (columns). Top row (a-c) is for changes in SSP2-4.5 between the future (2045-2064) and the baseline (2020-2039) periods, and bottom row (d-f) is for changes between the G6-SAI-1.5K simulations (2045-2064) and the baseline (2020-2039 mean of SSP2-4.5). Contours show the corresponding climatological ozone volume mixing ratios (in ppm) in the SSP2-4.5 runs for reference. Hatching marks the region where the response is not statistically significant (taken as smaller than ±2 standard errors in the difference in means)

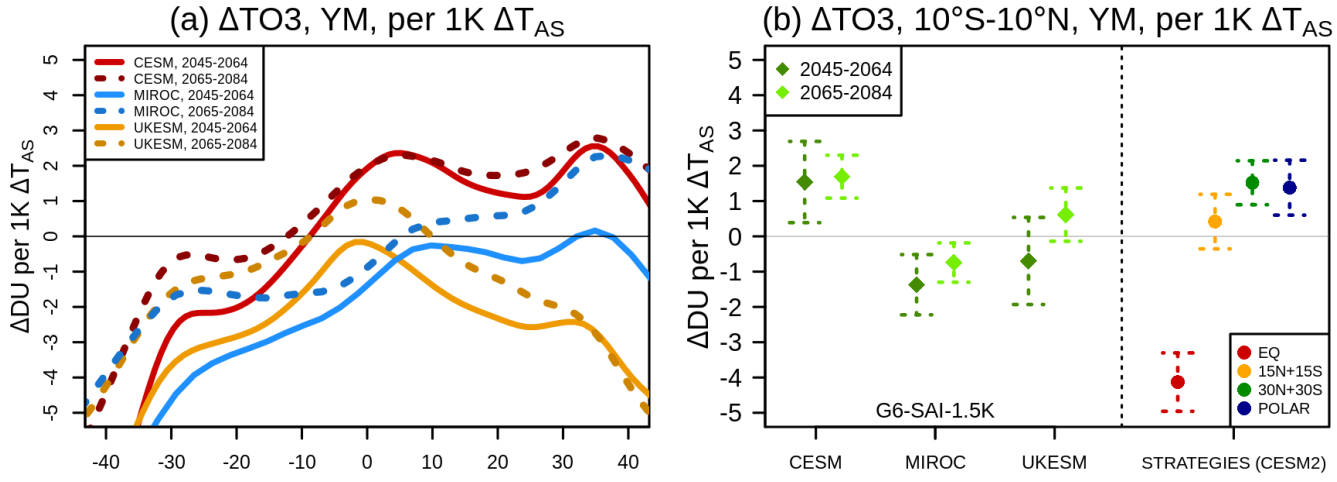

Figure S3. (a): Normalized annual mean total column ozone response per 1 K global mean near-surface air cooling in each model (colors) for 2045-2064 (solid) and 2065-2084 (dashed) as a function of latitude (between 40°S and 40°N). (b): As in Figure 3(c) in the main text but for the changes in total ozone column averaged over the deep tropical 10°S-10°N region.

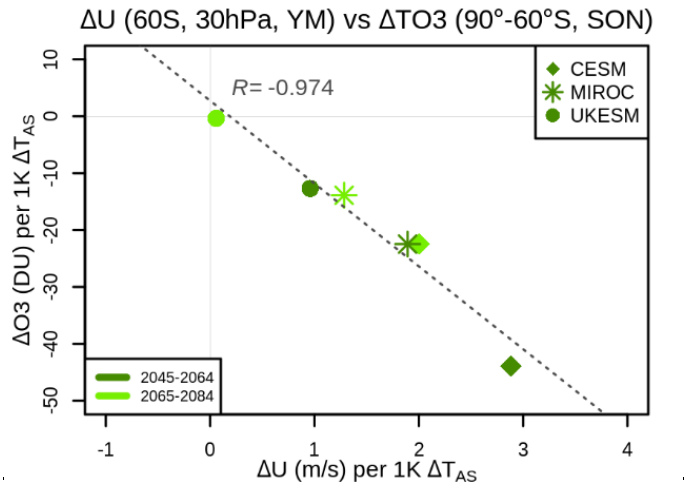

Figure S4. As in Figure 11(c) in the main text but for the correlation between the normalized changes in the springtime Antarctic total column ozone and annual mean polar vortex strength.

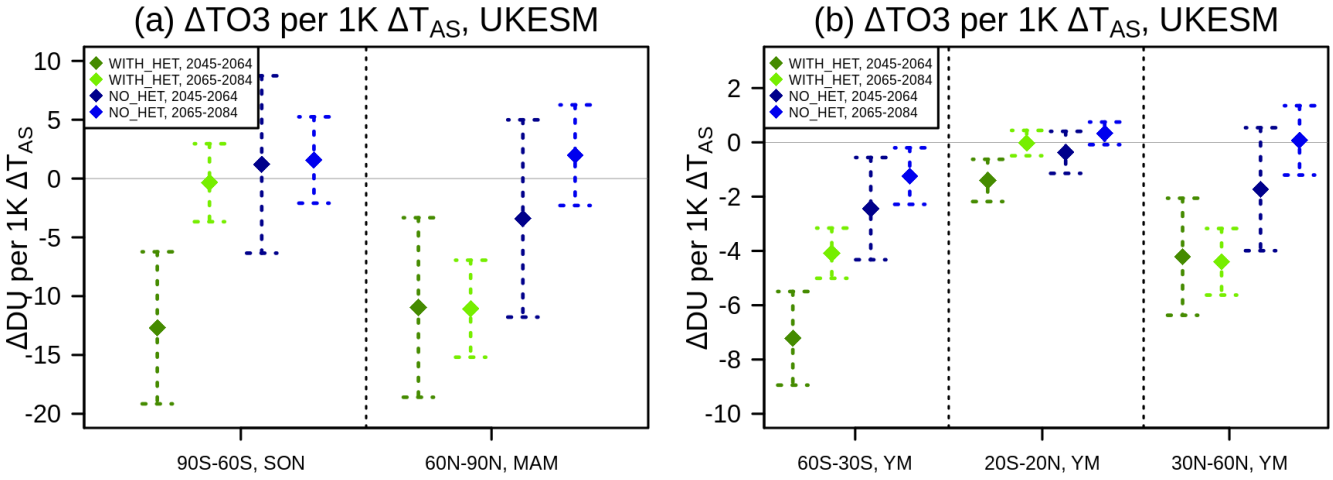

Figure S5. Normalized total column ozone changes between the UKESM G6-SAI-1.5K and SSP2-4.5 simulations averaged over either 2045-2064 or 2065-2084 periods and scaled with the corresponding global mean near-surface air temperature change. Green points are for the ozone responses in the fully coupled simulations with heterogeneous chemistry on SAI aerosols included (WITH_HET), and blue points are the sensitivity simulations without it (NO_HET). Panel (a) shows the responses in springtime Antarctic and Arctic ozone, and panel (b) shows annual mean responses in the SH mid-latitudes, tropics and NH-mid-latitudes. The error bars represent +/- 2 standard errors in the difference in means.

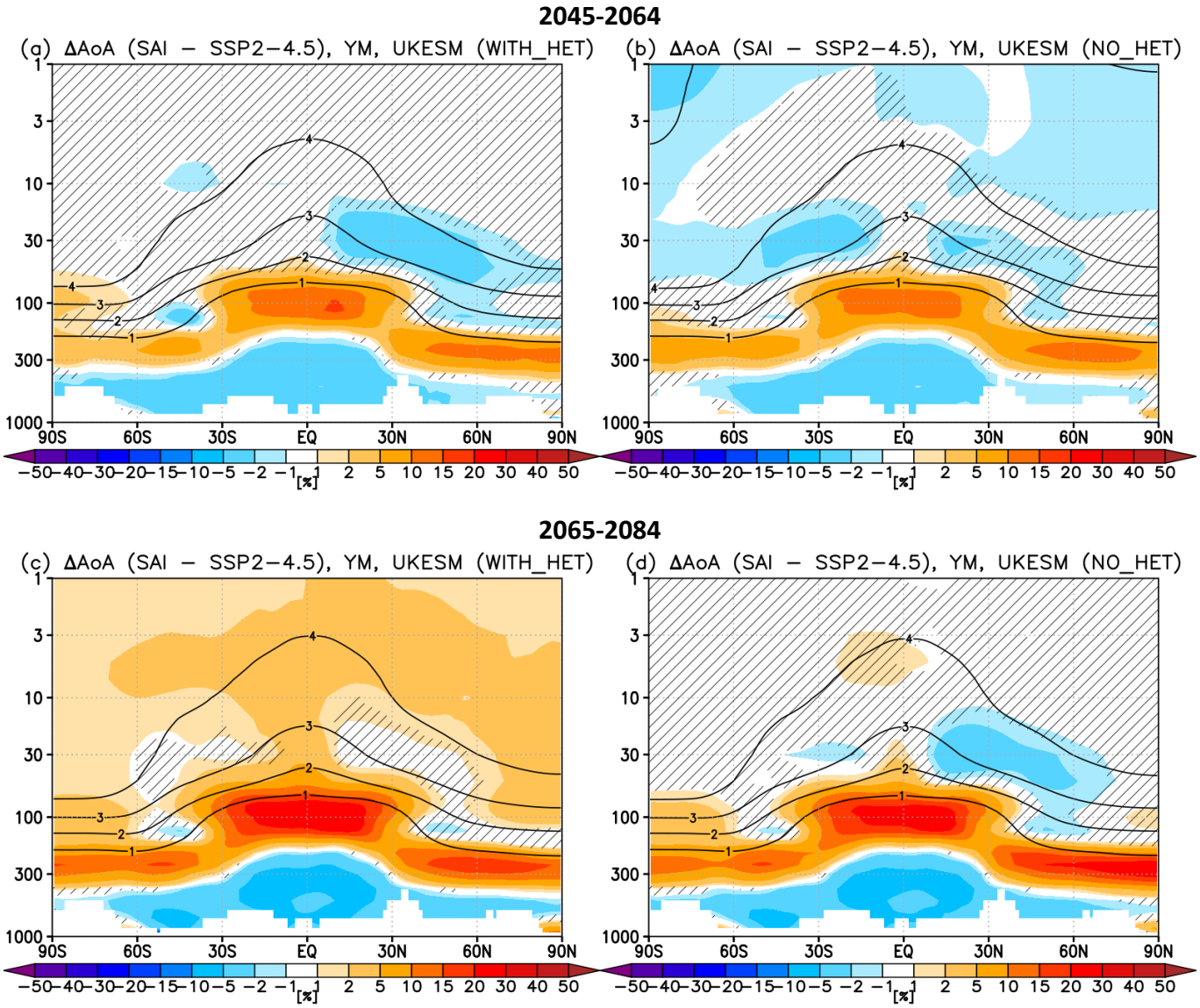

Figure S6. Shading: Annual mean (top, a-b) 2045-2064 and (bottom, c-d) 2065-2084 changes in age-of-air between the UKESM G6-SAI-1.5K simulations and the SSP2-4.5 simulations over the same period. Left column (a,c) is for the default simulations discussed in the paper, right column (b,d) is for the sensitivity simulation without heterogenous chemistry on SAI sulfate aerosols (i.e. original G6-SAI-1.5K run). Contours show the corresponding climatological values (in units of years) in the SSP2-4.5 runs for reference. Hatching denotes regions where the response is not statistically significant (defined as in Fig. 1)