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Supplement of

Southern Annular Mode persistence and westerly jet: a reassessment using high-resolution global models

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Table S1. Annual and early-summer (NDJ) SAM persistence (the decorrelation timescale of the SAM index; τ) and westerly jet position for the 31 studied CMIP6 models (historical simulations) and ERA5 for the same period of 1980-2014.

Model	τ (days)		Jet latitude (°)	
	Annual	NDJ	Annual	NDJ
TaiESM1	8.2	11.6	-52.4	-50.4
AWI-ESM-1-1-LR	12.0	21.2	-49.0	-50.4
AWI-ESM-1-REcoM	14.1	25.1	-49.7	-50.4
BCC-CSM2-MR	11.2	21.5	-51.1	-50.3
BCC-ESM1	14.2	30.2	-50.5	-49.5
FGOALS-f3-L	11.4	16.6	-49.7	-48.9
FGOALS-g3	9.4	12.2	-49.7	-49.5
CanESM5	10.2	14.5	-49.6	-49.8
IITM-ESM	13.2	22.5	-47.0	-47.0
CNRM-CM6-1	11.3	18.7	-48.2	-48.4
CNRM-CM6-1-HR	9.8	12.6	-45.8	-46.2
CNRM-ESM2-1	11.9	20.2	-48.5	-48.4
ACCESS-CM2	13.9	27.0	-50.1	-49.6
EC-Earth3	9.4	12.9	-50.3	-49.5
MPI-ESM-1-2-HAM	12.7	24.3	-49.9	-49.7
INM-CM4-8	9.2	9.5	-51.7	-53.4
INM-CM5-0	10.7	15.2	-50.3	-52.0
IPSL-CM6A-LR	12.7	22.9	-49.2	-48.9
MIROC6	11.7	20.3	-48.7	-49.6
MPI-ESM1-2-HR	11.9	15.6	-48.8	-48.4
MPI-ESM1-2-LR	10.0	14.3	-47.9	-48.4
MRI-ESM2-0	16.0	32.1	-48.0	-47.0
GISS-E2-1-G (1)	13.2	23.4	-51.1	-50.9
GISS-E2-1-G (2)	10.8	17.0	-50.8	-50.5
CESM2	9.0	13.4	-51.9	-52.3
CESM2-FV2	9.3	13.9	-52.7	-52.2
CESM2-WACCM	11.6	16.3	-52.0	-51.9
CESM2-WACCM-FV2	11.2	17.3	-52.3	-51.7
NorESM2-LM	7.1	9.6	-52.6	-51.6
NorESM2-MM	9.1	13.0	-52.6	-52.2
GFDL-CM4	9.2	12.4	-49.0	-48.7
ERA5	7.9	10.9	-51.1	-50.4

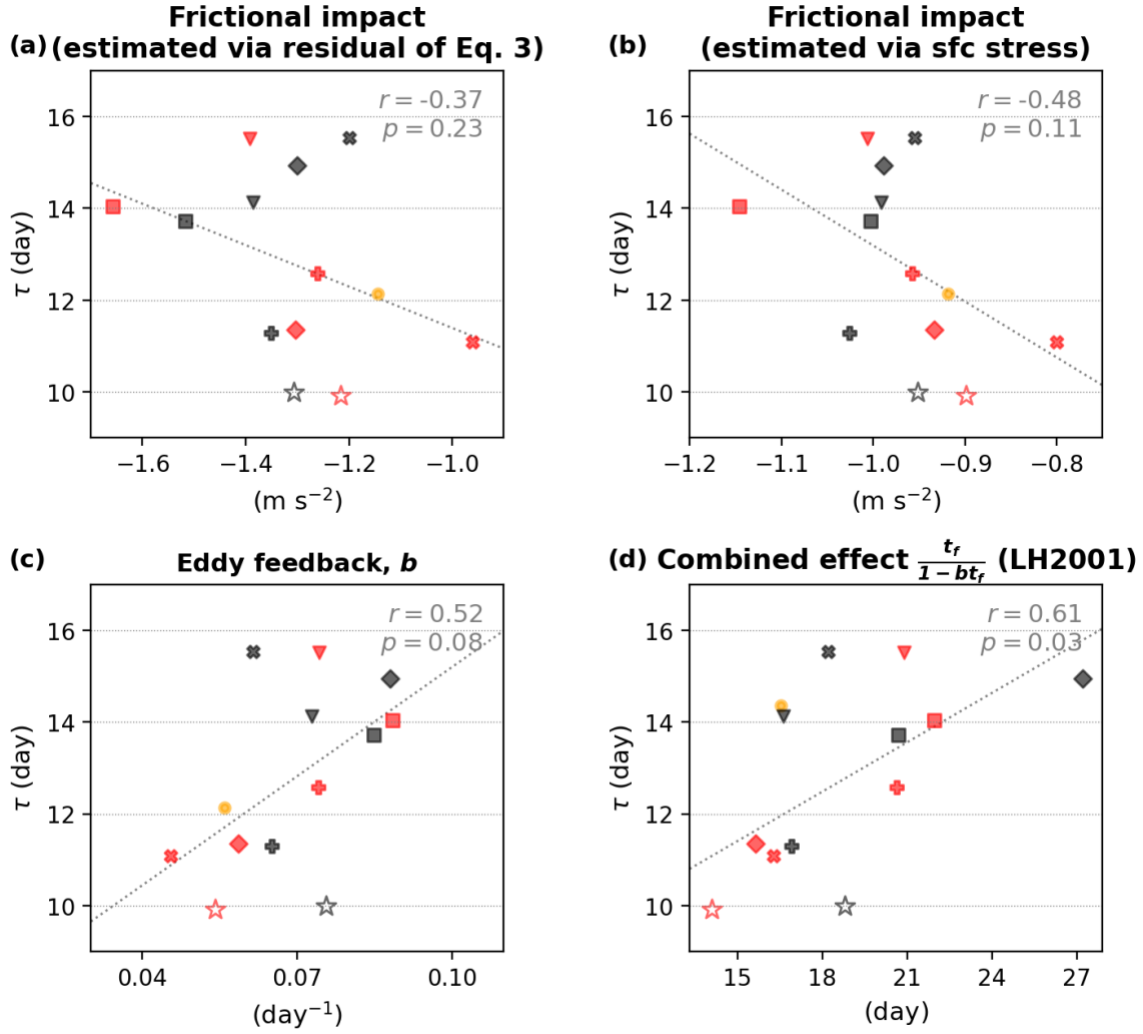


Figure S1. (a) Scatter plot of τ and the frictional impact estimated as the residual of Eq. 3 in the main article (black and red markers are for ObsSST and NoEddies experiments, respectively; star markers indicate the 9-km simulations and the rests are the 28-km runs; yellow circle represents ERA5). (b) Scatter plot of τ and the eddy feedback strength, b . (d) Scatter plots of τ and the combined effects of friction (expressed as Rayleigh damping timescale, t_f) and eddy feedback strength b , measured as $\frac{t_f}{1-bt_f}$ following Lorenz and Hartmann (2001). In all subplots, the dotted gray line represents the linear regression fit, and the correlation coefficient and p value are shown in the top-right corner.