Supporting Information for "Evaluating the Role of Kernel Choice on Radiative Feedback Estimates"

Kaitlyn Wen[1], Ivan Mitevski[2], Tyler P. Janoski[3,4,5,6], Gabriel A. Vecchi[2,7]

[1]Department of Computer Science, Princeton University, Princeton, NJ

[2]Department of Geosciences, Princeton University, Princeton, NJ

[3]Department of Environmental Sciences, Rutgers University, New Brunswick, NJ

[4]The City College of the City University of New York, New York, NY, USA

[5]NOAA-CESSRST-II, The City College of the City University of New York, New York, NY

[6]NOAA/OAR National Severe Storms Laboratory, Norman, OK

[7]High Meadows Environmental Institute, Princeton University, Princeton, NJ

Contents of this file:

August 6, 2026, 1:19pm

Table S1. CMIP5 and CMIP6 models used to calculate individual radiative feedbacks.

ACCESS-CM2	GISS-E2-2-G	IPSL-CM5A-MR
ACESS-CM2	INM-CM4-8	IPSL-CM5B-LR
AWI-CM-1-1-MR	INM-CM5-0	MIROC-ESM
BCC-CSM2-MR	IPSL-CM6A-LR	MPI-ESM-MR
BCC-ESM1	KACE-1-0-G	MRI-CGCM3
CAMS-CSM1-0	MIROC6	NorESM1-M
CanESM5	MPI-ESM1-2-HR	MPI-ESM-LR
CESM2	MPI-ESM1-2-LR	MIROC5
CESM2-FV2	NESM3	GISS-E2-R
CESM2-WACCM	NorCPM1	INM-CM4
CESM2-WACCM-FV2	NorESM2-MM	IPSL-CM6A-MR1
E3SM-1-0	SAM0-UNICON	CCSM4
GFDL-CM4	TaiESM1	E3SM-2-0
GFDL-ESM4	BNU-ESM	E3SM-2-0-NARRM
GISS-E2-1-G	CanESM2	CMCC-CM2-SR5
GISS-E2-1-H	IPSL-CM5A-LR	CMCC-ESM2

Table S2. Radiative kernels used to calculate individual radiative feedbacks and the base state they are derived from (observational product vs. model).

Kernel	base state
BMRC	model
CAM3	model
CAM5	model
CERES	observation
ECHAM6	model
ECMWF-RRTM	observation
ERA5	observation
GFDL	model
HadGEM2	model
HadGEM3-GA7.1	model

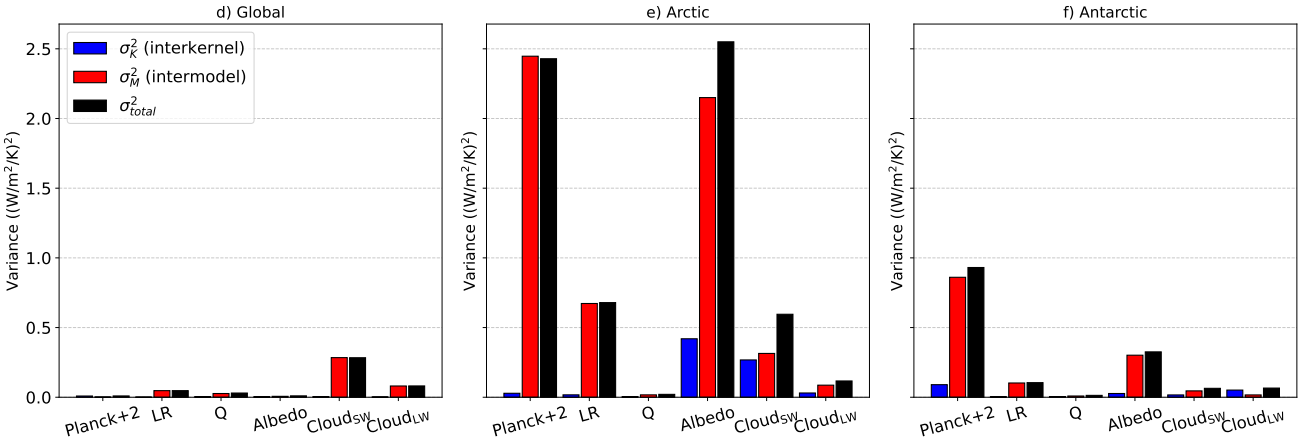

Figure S1. Range of interkernel (blue), intermodel (red), and combined (black) spread representing variance, as in Figs. 1d-f but with the same limits on the y-axis.

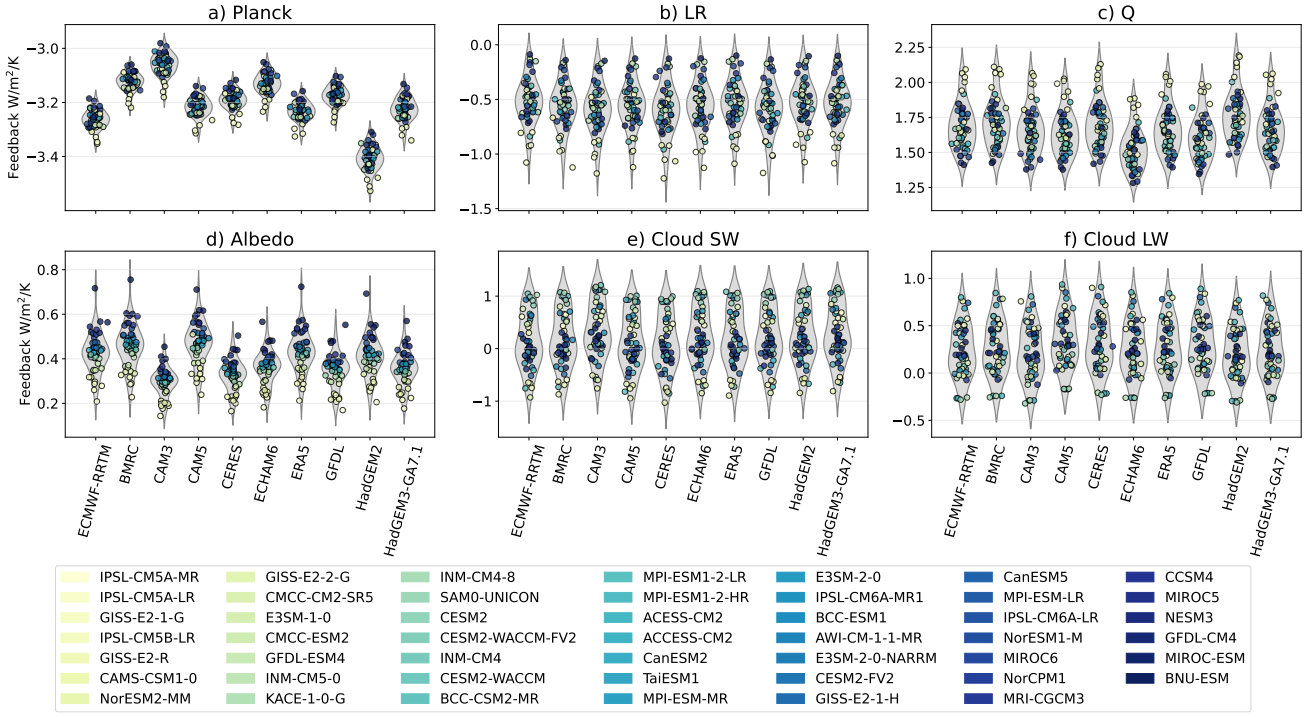

Figure S2. Feedbacks are shown for all 48 models for each of the 11 kernels shown for a) Planck, b) lapse rate, c) water vapor, d) albedo, e) shortwave cloud, and f) longwave cloud.

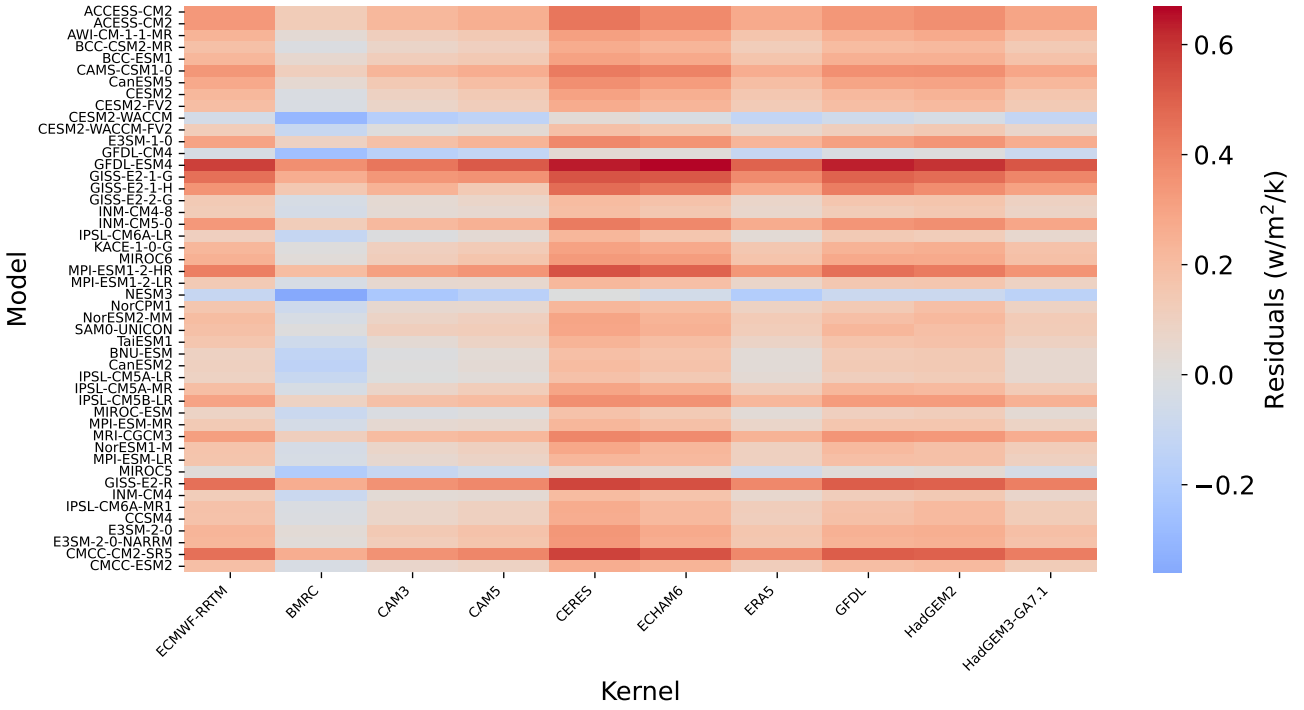

Figure S3. Heatmap of residuals shown for each of the 10 kernels (y-axis) and the 48 models (x-axis).

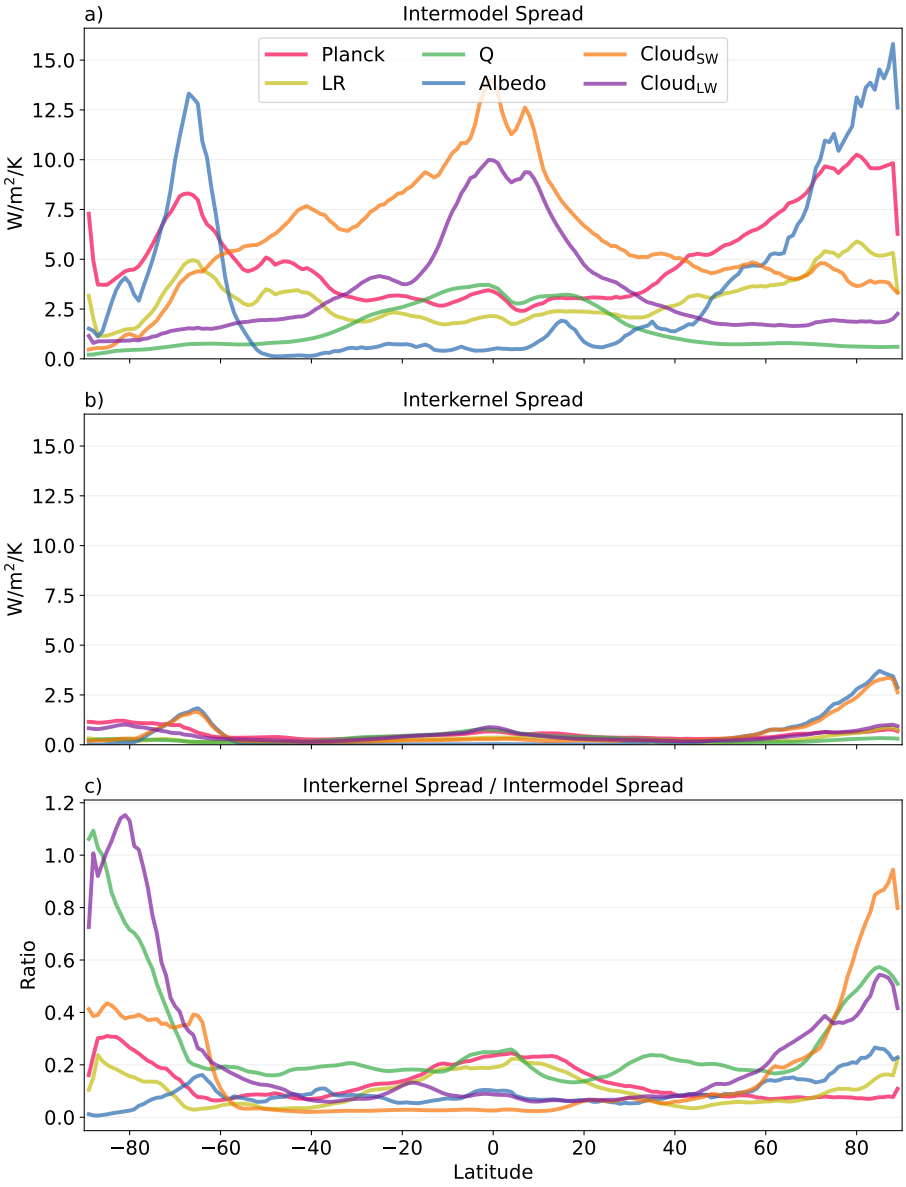

Figure S4. a) Intermodel and b) interkernel spread and c) the ratio, which is the same as in Fig. 2a in the manuscript. The spread is defined as the range between the minimum and maximum values. For the interkernel spread, this range is calculated across 10 kernels, each averaged over 48 models. For the intermodel spread, the range is calculated across 48 models, each averaged over 10 kernels.

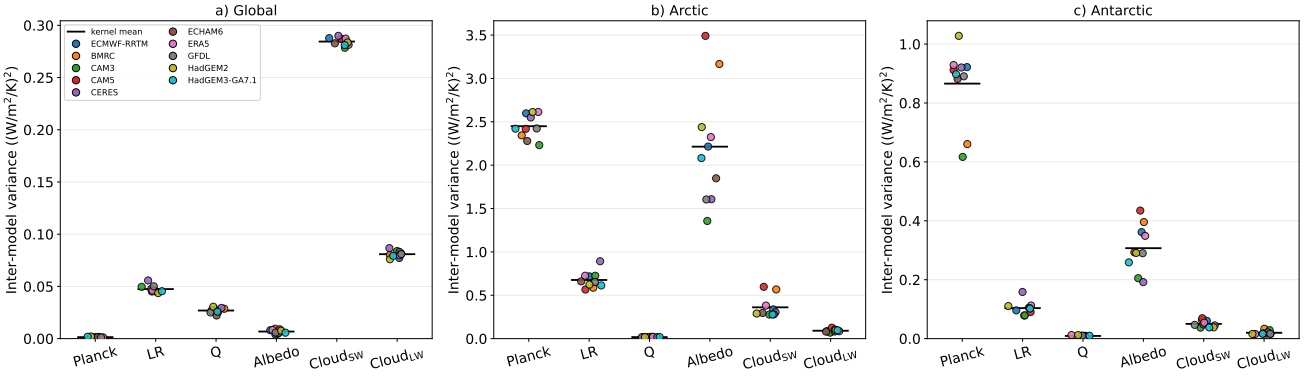

Figure S5. Inter-model variance of each radiative feedback computed separately under each of ten radiative kernels, for (a) global, (b) Arctic, and (c) Antarctic means. Each colored point shows the variance across the model ensemble, evaluated with a single kernel (color); the black bar shows the mean over kernels.