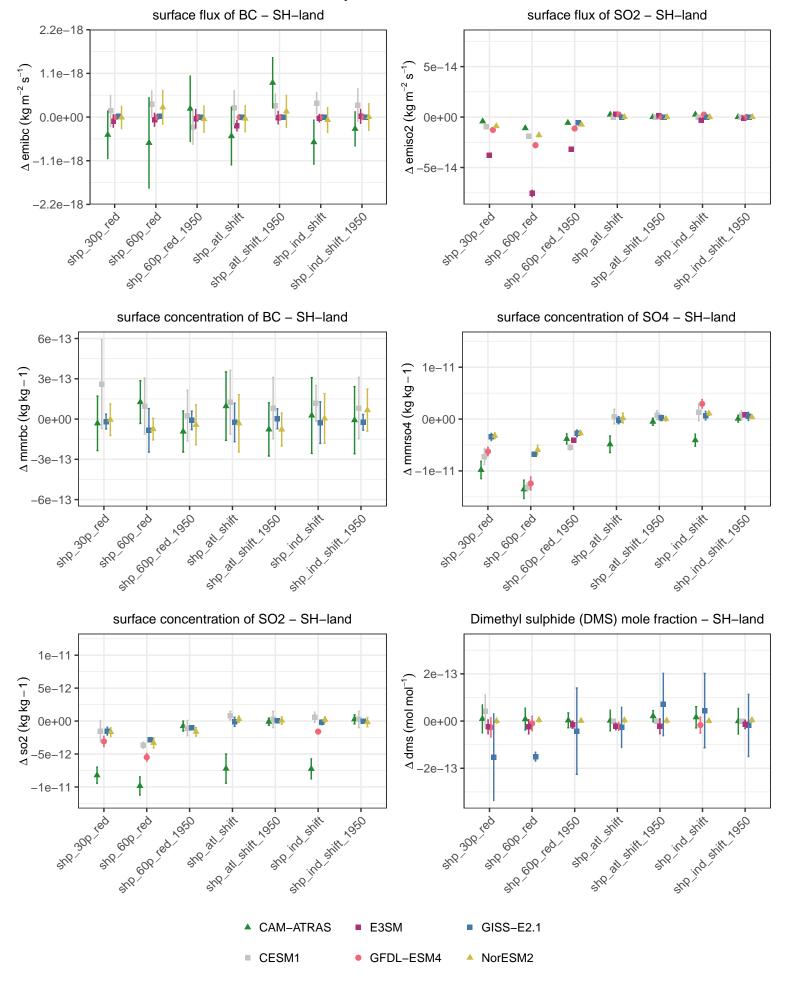
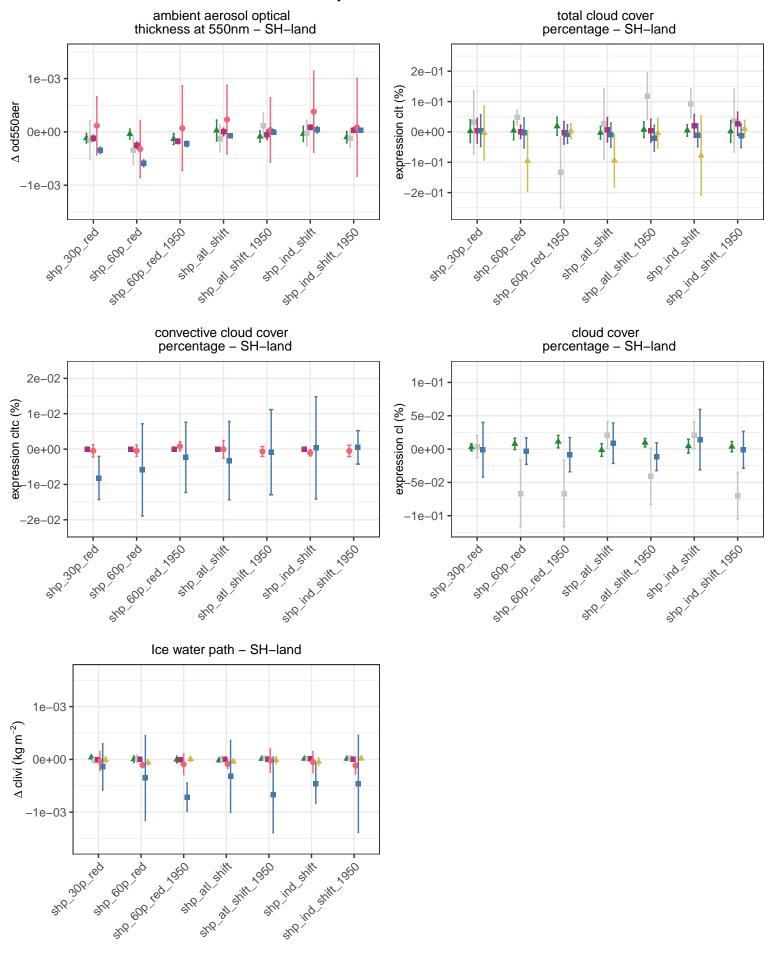
## Summary – absolute difference



#### Summary - absolute difference upwelling longwave flux upwelling shortwave flux net radiative flux at TOA - SH-land at TOA - SH-land at TOA - SH-land 1.0 1.0 1.0 $\Delta$ rlut + rsut (W m – 2) $\Delta$ rlut (W m – 2) $\Delta \operatorname{rsut}(\operatorname{Wm}-2)$ 0.5 0.5 0.5 0.0 0.0 0.0 -0.5 0.5 -0.5-1.0-1.0-1.0318 600 188 7950 sho ind shift 1960 sto all stift, 1950 310 600 led 1950 sho ind shift 1950 STR 21 STIFL 250 sho ind shift loso ste all stift. Jose snP at shift she ind shift snP at shift she ind shift STP all STIFF she ind shift sub en lag elb log sub en lag clear-sky net radiative flux implied cloud response at TOA incident shortwave flux – SH-land at TOA - SH-land at TOA - SH-land $\Delta$ rlut + rsut - rlutcs - rsutcs (W m<sup>-2</sup>) $\Delta$ rlutcs + rsutcs (W m – 2) 1.0 1.0 1.0 $\Delta \operatorname{rsdt} (\operatorname{Wm} - 2)$ 0.5 0.5 0.5 0.0 0.0 0.0 -0.5 -0.5 -0.5 -1.01.0 -1.0470 600 red 1950 SHO all shift. +10 600 led 1950 Stopind Shit 1950 Sto ind shift 1950 snP ind shift Stopind Shit 1950 Sto all Shift 1950 STR all SHIP. JOSO snp ind shift STP at shift STR at STIFF sno ind shift Sub, end leg STR all STIFF and end tog sub en leg upwelling clear-sky shortwave upwelling clear-sky longwave flux at TOA - SH-land flux at TOA - SH-land 1.0 1.0 $\Delta \operatorname{rsutcs} (\operatorname{Wm} - 2)$ $\Delta$ rlutcs (W m-2) 0.5 0.5 0.0 0.0 -0.5 -0.5 -1.0-1.0and end led led led +10 600 red 1050 SHP all SHIP. and ind shift 1950 SHP all SHIP. Jobo sho ind shift 1950 STR all shift snp ind shift SIRP all SHIFT snp ind shift sub 300 leg sub cob leg sub en lag CAM-ATRAS E3SM GISS-E2.1 CESM1 GFDL-ESM4 NorESM2

# Summary - absolute difference



▲ CAM-ATRAS

CESM1

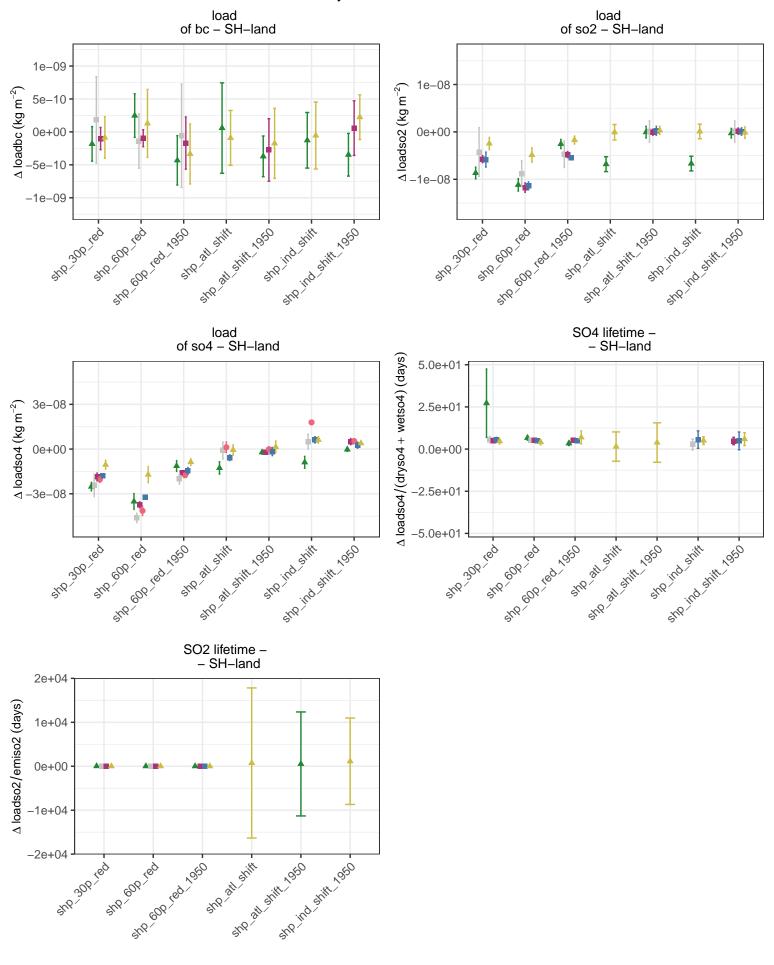
■ E3SM

GFDL-ESM4

GISS-E2.1

### Summary - absolute difference dry deposition rate of BC – SH–land wet deposition rate total deposition rate of BC - SH-land of BC - SH-land 7.9e-16 4.5e-15 3.6e-15 $\Delta$ drybc + wetbc (kg m – 2 s – 1) $\Delta$ drybc (kg m<sup>-2</sup> s<sup>-1</sup>) $\Delta$ wethc (kg m<sup>-2</sup> s<sup>-1</sup>) 3.9e-16 2.3e-15 1.7e-15 0.0e + 000.0e + 002.8e-16 3.9e-16 2.3e-15 2.2e-15 STR att Strike Ind strike 314 600 181 1850 + SHO IND SHIP JOSO 21.4 90 194 1940 + 1 SUR SH SHIP JOSO Str. of Stiff, 1980 SHO IND SHIP DEO sub 300 lag -7.9e-16 -4.5e-15 ste 300 teg -4.2e-15 stre 300 teg dry deposition rate wet deposition rate dry deposition rate of so2 - SH-land of so2 - SH-land of so4 - SH-land 4e-14 $\Delta$ wetso2 (kg m<sup>-2</sup> s<sup>-1</sup>) $\Delta$ dryso2 (kg m<sup>-2</sup> s<sup>-1</sup>) 2e-2e-14 $\Delta$ dryso4 (kg m $^{-2}$ s $^{-1}$ 1e-14 0e+00 0e+00 0e+00 2e-14 1e-14 -2e-14 Sto of Stiff Street 314 600 ted 1989 Sto off Stiff 1960 Stopped Stift 1960 Sto of Stiff 1950 SHO JIN SHIRL JOSO 3.14.000 fed. 1989. sub 300 leg , 806 lag she ind shift SIRP all SHIFT sno ind shift -4e-14 \$10<sup>300</sup> 100 sub 300 leg (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3wet deposition rate total deposition rate of so4 - SH-land of S - SH-land 5.0e-14 1e-13 $\Delta$ wetso4 (kg m<sup>-2</sup> s<sup>-1</sup>) 5e-14 2.5e-14 $(kg m^{-2} s^{-1})$ 0e+00 0.0e+00-2.5e-14 By Sub Stiff Oppor -1e-13 SW of Stiff, 1950 4460 18d 1960 strong and shift 1950 31490 Str. 4 snPind shift subject still of o sub 300 teg , 600 leg CAM-ATRAS E3SM GISS-E2.1 CESM1 GFDL-ESM4 NorESM2

# Summary - absolute difference



▲ CAM-ATRAS

CESM1

E3SM

NorESM2

## Summary - absolute difference $\Delta$ clear – sky shortwave flux (W m<sup>-2</sup>) 0.050 - $\Delta$ shortwave flux (W m $^{-2}$ ) $_{\Delta}$ shortwave flux (W m $^{-2})$ 0.1 -0.025 -0.0 0.0 -0.000 -0.025-0.050-4e-08 -2e-08 0e+00 0e+00 -10000 10000 -1e-08 $\Delta$ SO4 column burden (kg m<sup>-2</sup>) $\Delta$ SO2 column burden (kg m<sup>-2</sup>) Δ SO2 lifetime (days) 50 -1e-08 - $\Delta$ SO4 column burden (kg m $^{-2}$ ) 40 -0e+00 -∆ SO2 lifetime (days) -1000010 -0 ∆ SO4 lifetime (days) 30 -20 -10 -0 --5e-08 **-**0e+00 -1e-08 -5e-09 0e+00 -1e-08 -5e-09 -4e-08 -2e-08 0e+00 $\Delta$ SO2 column burden (kg $\rm m^{-2}$ $\Delta$ SO2 column burden (kg m<sup>-2</sup> $\Delta$ SO4 column burden (kg m<sup>-2</sup>) 2e-13 **-**∆ SO2 column burden (kg m<sup>-2</sup> $\Delta$ net radiative flux (W m $^{-2}$ ) 0e+00 **-** $\Delta$ DMS (mol mol<sup>-1</sup>) -5e-09 **-**-2e-13 1e-08 -0.2-8e-12 -4e-12 0e+00 -1e-08 -5e-09 -1e-08 -5e-09 $\Delta$ SO2 (kg kg<sup>-1</sup>) Δ SO2 lifetime (days) $\Delta$ SO2 column burden (kg m<sup>-2</sup>) CAM-ATRAS E3SM GISS-E2.1

GFDL-ESM4

-NorESM2

CESM1