# Number of Model Layers below 400 m: SO2-at-height (absolute difference) surface flux of BC - global surface flux of SO2 - global 2e-13 $\Delta$ emiso2 (kg m<sup>-2</sup> s<sup>-1</sup>) 0e+00 -6.1e-20 -2e-13 2 2 3 5 6 3 5 6 Number of Layers < 400 m Number of Layers < 400 m surface concentration of BC - global surface concentration of SO4 - global 2e-10 $\Delta$ mmrso4 (kg kg – 1) 1e-10 0e+00 -1e-10 -2e-10 2 2 3 5 3 5 Number of Layers < 400 m Number of Layers < 400 m surface concentration of SO2 - global surface concentration of DMS - global 1e-12 $\Delta$ dms (kg kg – 1) 5e-13 0e+00 -5e-13 -1e-12

2

MIROC-SPRINTARS

GISS modelE

NorESM2

3

4

Number of Layers < 400 m

OsloCTM3

UKESM1

5

6

1.2e-19

6.1e-20

0.0e+00

-1.2e-19

2e-12

1e-12

0e+00

-1e-12

-2e-12

5e-10

0e+00

-5e-10

2

3

4

CAM-ATRAS

CESM

CESM2

Number of Layers < 400 m

5

6

E3SM

**GEOS** 

GFDL-ESM4

 $\Delta$ so2 (kg kg –1)

 $\Delta$  mmrbc (kg kg-1)

 $\Delta$  emibc (kg  $\mathrm{m}^{-2}~\mathrm{s}^{-1})$ 

## Number of Model Layers below 400 m: SO2-at-height (absolute difference) column mass burden of SO4 - global column mass burden of SO2 - global 4e-07 2e-07 $\Delta$ loadso2 (kg $\mathrm{m}^{-2})$ 0e+00 0e+00 -2e-07 -4e-07 2 2 3 3 5 6 5 6 Number of Layers < 400 m Number of Layers < 400 m SO4 lifetime - global column mass burden of BC - global ∆ loadso4/(dryso4 + wetso4) (days) 1e-09 1e+01 0e+00 0e+00 -1e-09 -1e+01 3 4 5 2 3 5 6 Number of Layers < 400 m Number of Layers < 400 m SO2 timescale - global 1.5e+10 1.0e+10 5.0e+09 0.0e+00-5.0e+09 -1.0e+10 -1.5e+10 3 5 4 6 Number of Layers < 400 m

GISS modelE

NorESM2

MIROC-SPRINTARS

OsloCTM3

UKESM1

 $\Delta$  loadso4 (kg m<sup>-2</sup>)

 $\Delta \log dbc \, (\mathrm{kg} \; \mathrm{m}^{-2})$ 

∆ loadso2/emiso2 (days)

CAM-ATRAS

CESM

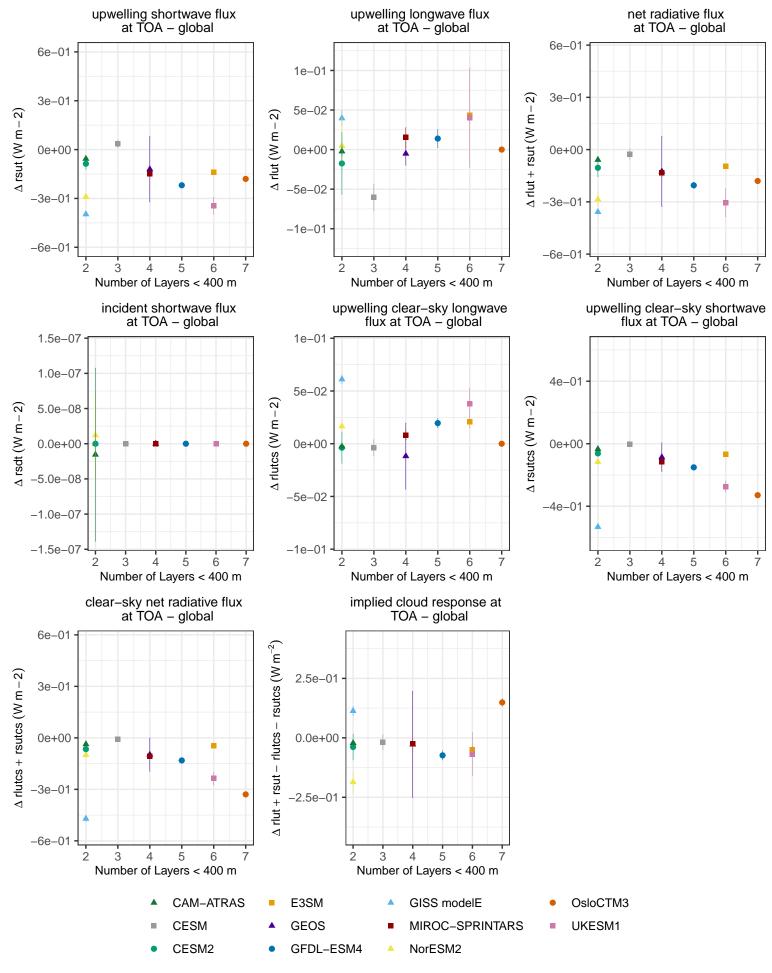
CESM2

E3SM

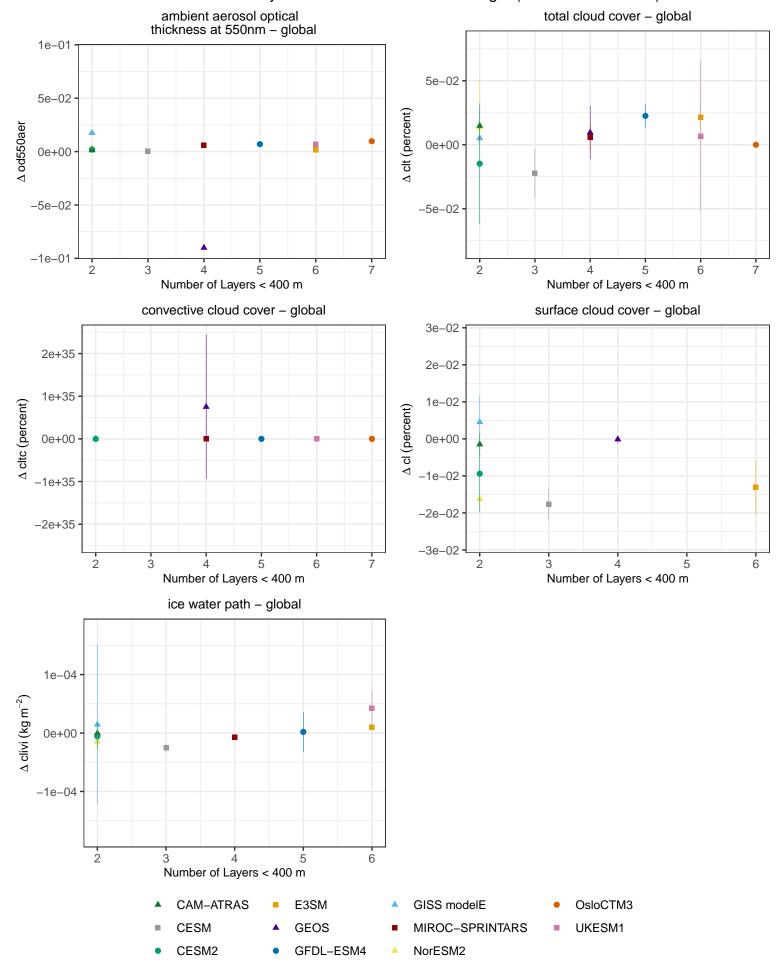
**GEOS** 

GFDL-ESM4

### Number of Model Layers below 400 m: SO2-at-height (absolute difference)



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