## so2-no-season: absolute difference surface flux of SO2 – global surface flux of BC – global surface concentration surface concentration of SO4 – global surface concentration of SO2 – global of BC – global 0e+00 4e-01 1e-01 emibc (kg m-2 s-1) emibc (kg m-2 s-1) mmrso4 (kg kg-1) mmrbc (kg kg-1) so2 (kg kg-1) -1e-02 2e-01 0e+00 -1e-01 -2e-02 0e+00 -2e-01 \_3e\_01 2001 2002 2003 2004 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year upwelling longwave flux at TOA – global upwelling shortwave flux at TOA – global incident shortwave flux at TOA – global upwelling clear-sky longwav flux at TOA - global net radiative flux at TOA - global 2e-02 rlut + rsut (W m-2) 2e-08 ·lutcs (W m-2) rsdt (W m-2) rlut (W m-2) rsut (W m-2) 1e-08 0e+00 2e-02 -5e-03 0e+00 0e+00 0e+00 -1e-08 -1e-022003 2003 2002 2003 2001 2002 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2004 2001 Year Year Year Year Year upwelling clear-sky shortwav clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - global flux at TOA - global at TOA - global of BC – global of BC - global 2e-01 2e-01 rlut+rsut-rlutcs-rsutcs(W~m^ 2e-02 ·lutcs + rsutcs (W m-2) 7.5e-02 wetbc (kg m-2 s-1) drybc (kg m-2 s-1) rsutcs (W m-2) 1e-01 0e+00 1e-01 5.0e-02 5.0e-02 -2e-02 0e+00 2.5e-02 2.5e-02 -4e-02 -1e-01 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of SO2 – global wet deposition rate of SO4 – global total deposition rate of BC – global wet deposition rate of SO2 – global dry deposition rate of SO4 – global 1e+00 drybc + wetbc (kg m-2 s-1) 1e+00 1e-01 wetso2 (kg m-2 s-1) dryso2 (kg m-2 s-1) 5e-01 wetso4 (kg m-2 s-1) dryso4 (kg m–2 s–1) 1.0e+00 -5e-01 8e-01 0e+00 0e+00 5.0e-01 6e-01 -1e-014e-01 -1e+00 -2e-0 -5.0e-01 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1) ambient aerosol optical total deposition rate total cloud cover convective cloud cover of S - global thickness at 550nm - globa percentage - global percentage - global 0e+00 1e-01 1e-01 4e-01 -2e+0 % 0e+00 cltc ( -4e+01 0e+00 0e+00 -6e+01 -1e-01 -4e-01 2002 2003 2002 2003 2002 2002 2003 Year Year Year Year

CESM<sub>1</sub>

E3SM

GISS

CESM2

MIROC

NorESM2

**GFDL** 

OsloCTM3

**UKESM** 

**GEOS**