## so2-no-season: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - global of SO2 - global of BC - global of SO4 - global of SO2 - global 2e-01 00+00 1.5e+00 1e-01 -1e+00-1e-021.00+00 ∆ emibc -1e-01 -2e-02 0e+00 -2e-01 -3e+00 0.0e+0.0-3e-01 -3e-02 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year upwelling longwave flux at TOA – global upwelling shortwave flux at TOA – global net radiative flux at TOA – global incident shortwave flux at TOA – global upwelling clear-sky longwav flux at TOA - global 4e-08 4e-01 3e-08 2e-02 -02 3e-01 2e-08 1e-02 rsut 0e+00 ∆ rlut + 1e-08 0e+00 1e-01 -2e-02 -08 0e+00 2002 2003 2004 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year upwelling clear-sky shortwave flux at TOA - global clear-sky net radiative flux at TOA – global implied cloud response dry deposition rate wet deposition rate at TOA - global of BC – global of BC - global rsutcs) 5.0e-02 4e-01 3e-01 2.5e-02 rlutcs -3e-01 ∆ rsutcs 0e+00 ∆ rlutcs + 2e-01 0e+00 rsut \_2 5e\_02 1e-01 1e-01 -1e-01 -5.0e-02 0e+00 0e+002002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year dry deposition rate of SO4 – global total deposition rate dry deposition rate wet deposition rate wet deposition rate of BC – global of SO2 – global of SO2 - global of SO4 - global 2e-01 1e+00 1.5e+00 1e-01 0e+00 1.0e + 0.01e+00 ∆ dryso2 ∆ wetso2 wetso4 0e+00 -1e-01 -1e+00 56-01 -2e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year $\frac{1}{3} dryso2 + wetso2)/2 + \frac{1}{3} dryso4 + wetso4)/3$ total deposition rate ambient aerosol optical total cloud cover - global convective cloud cover - glo surface cloud cover - global of S - global thickness at 550nm - globa 2e+00 0e+00 1e-01 -2e+01 1e+00 od550ae ㅎ 0e+00 0.0e+00 ا کا کا 0e+00 -5 0e-02 0e+00 -1e-01 -6e+0 -1 0e-01 -1e+00 -1.5e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year ice water path - global surface concentration column mass burden column mass burden column mass burden of DMS - global of BC - global of SO2 - global of SO4 - global 3e-01 1.2e+01 4e-01 2e-01 1e-01 9.0e+00 1e-01 oadso4 ∆ loadbc 0e+000e+00 6.0e+00 0e+00-1e-01 -1e+00 -1e-013.0e+0.0-2e-01 -2e-01 -2e+00-2e-01 0.0e + 0.02000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year

CAM5

CESM1

CESM2

E3SM

**GEOS** 

GFDL

**GISS** 

MIROC

NorESM2

OsloCTM3

**UKESM**