so2-at-height: absolute difference surface flux of BC – global surface flux surface concentration surface concentration of SO2 - global of BC - global of SO4 - global of SO2 - global 1.4e-19 Δ emibc (kg m⁻² s⁻¹) (kg kg - 1)emiso2 (kg m^{-2} s⁻¹ 2.0e-10 -2e-10 △ mmrbc (kg kg 0e+00 (kg kg-26-13 2.4e-20 -1e-12 ∆ mmrso4 1.0e-10 $\Delta so2$ (-6e-10 -3.5e-20 0e+00 -8e-10 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 upwelling clear-sky longwav flux at TOA - global net radiative flux incident shortwave flux at TOA – global at TOA - global 0e+00 1e-01 Ē Δ rlutcs (W m-2) Δ rlut (W m – 2) -1e-01 rsdt (Wm-2)4e-02 Ę ∆ rlut + rsut (W 5e-02 rsut (W 0e+00 _3e_∩1 -3e-01 -4e-0 -1e-0 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 upwelling clear-sky shortway flux at TOA - global clear-sky net radiative flux at TOA – global $\rm rsutcs \ (W\ m^{-2})$ implied cloud response dry deposition rate wet deposition rate at TOA - global of BC – global of BC - global 1.1e-15 8.0e-16 m^{-2} 0e+00 00+00 1e-01 Δ rsutcs (W m – 2) wetbc (kg m⁻² s⁻¹ drybc (kg $m^{-2} s^{-1}$ rsutcs (W -1e-01 0e+00 rlutcs --3e-0 4e-01 rsut--4e-01 rlut + 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 dry deposition rate of SO4 – global wet deposition rate of SO4 – global total deposition rate of BC – global dry deposition rate wet deposition rate of SO2 – global of SO2 - global Δ drybc + wetbc (kg m⁻² s⁻¹ 7.6e-16 wetso2 (kg m⁻² s⁻ drvso2 (ka m⁻² s⁻ $_{ m \Delta}$ dryso4 (kg m $^{-2}$ s $^{-}$ 2.0e-12 4.3e-16 Δ wetso4 (kg m⁻² 1.1e-16 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 dryso2 + wetso2)/2 + (dryso4 + wetso4)/3Year total deposition rate ambient aerosol optical total cloud cover - global convective cloud cover - glob surface cloud cover - globa of S - global thickness at 550nm - glob ∆ cltc (percent) 0.0e+00∆ clt (percent) ∆ cl (percent $(kg m^{-2} s^{-1})$ 0e+00 -2.5e-02 1e+35 -1e-13 0e+00 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 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 2e-04 $\Delta \log dso2 (kg m^{-2})$ 6e-07 Δ loadso4 (kg m $^{-2}$) Δ clivi (kg m $^{-2}$) loadbc (kg m⁻²) ∆ dms (kg kg −1) 1e-04 5e-07 4e-07 -5e-10 0e+00 3e-07 2e-07 -1e-04 0e+00 1e-07 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year

CAM5

CESM1

CESM2

E3SM

GEOS

GFDL

GISS

MIROC

NorESM2

OsloCTM3

UKESM