so2-no-season: absolute difference surface flux of SO2 – global surface flux of BC surface concentration surface concentration of SO4 – global surface concentration of SO2 – global global alobal 1e-13 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ $^{-2} s^{-1}$ mmrbc (kg kg⁻¹) mmrso4 (kg kg⁻¹ so2 (kg kg⁻¹) 0e+00 1e-14 -1e-13 0e+00 -2e-13 0e+00 -1e-14 -1.5e 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year incident shortwave flux at TOA – global clear-sky longwave flux at TOA - global longwave flux at TOA shortwave flux at TOA net radiative flux global global at TOA - global 0.04 0.03 1e-07 0.025 0.02 0.05 rlut + rsut $(W m^{-2})$ 0.000 0.00 rlutcs (W m⁻²) $rsut (W m^{-2})$ $rsdt (W m^{-2})$ rlut $(W m^{-2})$ 0.01 0.00 -0.025 0.00 -0.04 0e+00 -0.05 -0.050 -0.01 -0.08 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 Year Year Year Year Year clear-sky shortwave 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 3.2e-16 0.02 3.6e-16 $rlutcs-rsutcs \left(W \; m^{-2}\right)$ 0.02 rlutcs + rsutcs (W m⁻²) 2.1e-16 1.6e-16 0.00 $drybc (kg m^{-2} s^{-1})$ wetbc $(kg m^{-2} s^{-1})$ 0.00 rsutcs $(W m^{-2})$ -0.02 1.0e-16 -0.02 -0.02 -0.03 rlut + rsut --0.04 -0.04 -0.04 2001 2003 2001 2002 2003 2001 2003 2001 2002 2003 2001 2003 Year Year Year Year Year wet deposition rate of SO4 – global total deposition rate dry deposition rate wet deposition rate dry deposition rate of BC - global of SO2 – global of SO2 – global of SO4 – global 3.2e-16 1.5e-14 drybc + wetbc (kg m⁻² s⁻¹) wetso2 $(kg m^{-2} s^{-1})$ wetso4 $(kg m^{-2} s^{-1})$ 1.1e-16 $dryso4 (kg m^{-2} s^{-1})$ 9.3e-15 dryso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ 0e+00 -1.0e-16 3.9e-15 -3.1e-16 -6.9e-15 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year Year Year total deposition rate of S – global ambient aerosol optical convective cloud cover total cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3thickness at 550nm - globa percentage - global percentage - global 0.0075 0.000 0.0050 0.05 2e-14 -0.025 $(kg m^{-2} s^{-1})$ 0.0025 clt (%) 0.00 1e-14 -0.050 0.0000 0e+00 -0.05 -0.075 -0.0025 -1e-14 -0.10-0.0050 2001 2002 2003 2004 2002 2003 2002 2003 2001 2004 2001 2002 2003 2004 2001 2004 Year Year Year Year

CFSM1

CESM2

F3SM

GEOS

GFDI

GISS

MIROC

NorESM2

OsloCTM3

UKESM