no-so4: absolute difference surface flux of BC - s-sea surface flux of SO2 - s-sea surface concentration surface concentration of BC - s-sea of SO4 - s-sea 1.1e-20 6.1e-21 emiso2 (kg m-2 s-1) 3e-14 emibc (kg m-2 s-1) mmrbc (kg kg-1) mmrso4 (kg kg-1) 2.0e-14 0e+00 1.5e-21 1.5e-14 -3.0e-21 1.0e-14 _6e_14 -7.5e-21 2003 2001 2002 2003 2001 2002 2004 2001 2002 2003 2001 2002 2003 Year Year Year Year upwelling longwave flux at TOA – s-sea upwelling shortwave flux at TOA – s-sea surface concentration net radiative flux at TOA - s-sea of SO2 - s-sea 0.025 1.5e-12 0.10 rlut + rsut (W m-2) 0.00 0.000 so2 (kg kg-1) rsut (W m-2) rlut (W m-2) 0.05 -0.05 -0.025 -0.050 0.00 5.0e-13 -0.10 -0.075 -0.05 2001 2003 2001 2002 2001 2002 2003 2001 2002 Year Year Year Year upwelling clear-sky longwave flux at TOA - s-sea upwelling clear–sky shortwave flux at TOA – s–sea clear-sky net radiative flux at TOA - s-sea incident shortwave flux at TOA - s-sea 0.005 0.02 rlutes + rsutes (W m-2) 0.01 0e+00 rsutcs (W m-2) rlutcs (W m-2) 0.01 rsdt (W m-2) 0.000 0.00 0.00 -0.005 -0.01 -0.01 -1e-07 -0.010 -0.02 -0.02 2004 2004 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year dry deposition rate of BC – s–sea wet deposition rate of BC – s–sea total deposition rate of BC – s–sea dry deposition rate of SO2 – s–sea 3.6e-17 1.6e-16 2.0e-14 1.6e-16 drybc + wetbc (kg m-2 s-1) drybc (kg m-2 s-1) dryso2 (kg m-2 s-1) wetbc (kg m-2 s-1) -5.0e-17 -1.3e-16 -1.8e-16 1.0e-14 5.3e-15 -1.4e-16 -5.1e-16 4.5e-16 2001 2001 2003 2001 2003 2004 2001 2003 2002 2003 2002 2002 2002 Year Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1) wet deposition rate dry deposition rate wet deposition rate total deposition rate of SO4 – s–sea of SO4 - s-sea of SO2 - s-sea 1.0e-14 -1.4e-154.1e-15 4.6e-15 wetso2 (kg m-2 s-1) 6.8e-15 dryso4 (kg m-2 s-1) wetso4 (kg m-2 s-1) -1.3e-15 3.4e-15 -6.7e-15 -1.5e-16 -1.3e-17 -3.4e-15 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year Year Year Year

CESM1

E3SM

GISS

MIROC

NorESM2