Reference – absolute SH-sea averages surface flux of BC – SH–sea surface flux of SO2 – SH-sea surface concentration of BC – SH–sea surface concentration of SO4 – SH–sea surface concentration of SO2 – SH–sea 1.6e-11 5e-12 2.0e-10 emiso2 $(kg m^{-2} s^{-1})$ $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ mmrso4 (kg kg⁻¹) $^{-1}$ nmrbc (kg kg $^{-1}$) 4e-14 so2 (kg kg⁻¹) 1.2e-11 3e-14 3.0e-10 1.0e-10 2002 2003 2001 2002 2003 2001 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year shortwave flux at TOA -SH-sea net radiative flux at TOA –SH–sea longwave flux at TOA – SH–sea incident shortwave flux at TOA – SH–sea clear-sky longwave flux at TOA - SH-sea -240.0 -262.5 rlut + rsut $(W m^{-2})$ -90 rlutcs $(W m^{-2})$ $rsut (W m^{-2})$ rlut $(W m^{-2})$ $rsdt (W m^{-2})$ 341.0 -265.0 -242.5 -340 340.5 -267.5 -345 -245.0 -100 340.0 -270 O -350 2002 2003 2001 2003 2001 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of BC – SH–sea wet deposition rate of BC – SH–sea clear-sky shortwave clear-sky net radiative implied cloud response flux at TOA - SH-sea flux at TOA - SH-sea at TOA - SH-sea rlutcs - rsutcs (W m⁻²) -300 rlutcs + rsutcs (W m⁻²) -30 wetbc $(kg m^{-2} s^{-1})$ $\rm rsutcs \, (W \, m^{-2})$ drybc (kg m^{-2} s⁻¹ -305 -35 40 -310 rlut + rsut -3 0e-14 2003 2003 2003 2001 2003 2001 2001 2002 2003 2001 2001 2002 Year Year Year Year Year total deposition rate of BC – SH–sea wet deposition rate of SO2 – SH–sea dry deposition rate of SO4 – SH–sea wet deposition rate of SO4 – SH-sea dry deposition rate of SO2 - SH-sea $drybc + wetbc (kg m^{-2} s^{-1})$ 1.5e-12 wetso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$) $dryso2 (kg m^{-2} s^{-1})$ $dryso4 (kg m^{-2} s^{-1})$ wetso4 (kg m⁻² s⁻¹) 1.2e-13 1.0e-12 2e-12 0.0e+00 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 Year Year Year ambient aerosol optical ickness at 550nm – SH-se total deposition rate of S – SH–sea convective cloud cover total cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3percentage - SH-sea percentage - SH-sea 3.5e-12 70 0.125 $(kg m^{-2} s^{-1})$ 3.0e-12 od550aer % clt (%) cltc 2.5e-12 20 0.075 60 2.0e-12 0 2001 2002 2003 2004 2002 2003 2002 2003 2004 2002 2003 2004 2001 2004 2001 2001 Year Year Year Year

CFSM1

CESM2

F3SM

GEOS

GFDI

GISS

MIROC

NorESM2

OsloCTM3

UKESM