Reference – absolute SH-sea averages surface concentration of BC – SH–sea surface flux of BC - SH-sea surface flux of SO2 - SH-sea surface concentration of SO4 – SH–sea surface concentration of SO2 – SH–sea 1.6e-11 5e-12 4.5e-10 2.0e-10 emibc (kg m-2 s-1) emiso2 (kg m-2 s-1) nmrbc (kg kg-1) so2 (kg kg-1) 1 20-11 mmrso4 (kg 3.5e-10 1.0e-1 2e-12 3.0e-10 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 Year Year Year Year Year upwelling longwave flux at TOA – SH-sea upwelling shortwave flux at TOA – SH-sea incident shortwave flux at TOA – SH–sea upwelling clear-sky longwave flux at TOA - SH-sea net radiative flux at TOA - SH-se 350 247 266 102 rlut + rsut (W m-2) 245 345 rlutcs (W m-2) rlut (W m-2) rsut (W m-2) rsdt (W m-2) 264 100 243 340 98 340.5 96 239 2001 2003 2001 2002 2003 2004 2001 2002 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 total deposition rate of BC – SH–sea upwelling clear-sky shortwave clear-sky net radiative flux at TOA - SH-sea flux at TOA - SH-sea 308 drybc + wetbc (kg m-2 s-1) 42 rlutcs + rsutcs (W m-2) drybc (kg m-2 s-1) rsutcs (W m-2) 306 wetbc (kg m-2 1.0e-13 40 8 0e-14 8 0e-14 2003 2003 2003 2003 2001 2002 2003 2001 2002 2001 2002 2001 2002 2001 2002 Year Year Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1)dry deposition rate of SO4 – SH-sea wet deposition rate of SO4 – SH-sea dry deposition rate of SO2 – SH-sea wet deposition rate of SO2 – SH-sea total deposition rate of S - SH-sea dryso2 (kg m-2 s-1) wetso2 (kg m-2 s-1) dryso4 (kg m-2 s-1) wetso4 (kg m-2 s-1 6e-12 1.0e-12 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year ambient aerosol optical thickness at 550nm – SH–sea convective cloud cover percentage – SH–sea total cloud cover 68 0.10 od550aer cltc (%) clt (%) 0.05 60 0 2002 2003 2002 2003 2004 2001 2002 2003 2004 2001 2004 2001

Year

MIROC

NorESM2

GFDI

GISS

OsloCTM3

Year

Year

CESM1

E3SM