so2-no-season: absolute difference surface flux of SO2 – SH–sea surface concentration of SO2 – SH–sea surface flux of BC – SH–sea surface concentration surface concentration of SO4 – SH–sea 0.0e+00 0e+00 emiso2 (kg m-2 s-1) 4.7e-19 mmrbc (kg kg-1) mmrso4 (kg kg-1) so2 (kg kg-1) 2.5e-14 -5.0e-13 3.0e-19 -1.2e-16 -2e-12 0.0e+00 1.3e-19 -3.9e-20 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year upwelling longwave flux at TOA – SH-sea upwelling shortwave flux at TOA – SH-sea net radiative flux at TOA – SH-sea incident shortwave flux at TOA – SH–sea upwelling clear-sky longwave flux at TOA - SH-sea 0.15 0.04 0.05 0.02 0.10 rlut + rsut (W m-2) rlutcs (W m-2) rsut (W m-2) sdt (W m-2) 1 0e-07 0.00 0.00 0.0 0.05 -0.02 0.00 -0.1 -0.05 -0.04 0.0e+00 -0.05 -0.06 2001 2002 2003 2001 2003 2001 2003 2001 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of BC – SH–sea total deposition rate of BC – SH–sea upwelling clear-sky shortwave clear-sky net radiative wet deposition rate flux at TOA - SH-sea flux at TOA - SH-sea of BC - SH-sea 1.2e-16 5.5e-16 6.6e-16 0.050 drybc + wetbc (kg m-2 s-1) rlutes + rsutes (W m-2) 0.02 drybc (kg m-2 s-1) wetbc (kg m-2 s-1) 2.4e-16 3.3e-16 0.025 3.7e-1 0.000 0.00 -0.025 -6.9e-16 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 Year Year Year Year Year wetso4)/3 (kg m-2 s-1) dry deposition rate of SO4 – SH–sea wet deposition rate of SO4 – SH-sea total deposition rate of S – SH–sea dry deposition rate wet deposition rate of SO2 - SH-sea of SO2 - SH-sea 2.2e-15 5.0e-15 8.1e-16 5.0e-15 wetso2 (kg m-2 s-1) wetso4 (kg m-2 s-1) dryso4 (kg m-2 s-1) 3.5e-16 2.0e-15 -8.9e-16 5.0e-15 (dryso2 + wetso2)/2 + (dryso4 -1.5e-15 -9.2e-16 -2.6e-15 -5 0e-15 -3.3e-15 -6.8e-15 -6.0e-15 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 Year Year ambient aerosol optical thickness at 550nm – SH–se. convective cloud cover total cloud cover percentage - SH-sea 0.008 0.00 0.004 -0.02 0.05 cltc (%) clt (%) 0.000 0.00 -0.04 -0.004

2003

Year

2004

OsloCTM3

UKESM

MIROC

NorESM2

2002

2001

GFDI

GISS

emibc (kg m-2 s-1)

0.1

rlut (W m-2)

rsutcs (W m-2) 0.01

dryso2 (kg m-2 s-1)

od550aer

-0.06

2001

2002

2003

Year

2004

-0.05

2001

2002

Year

CESM1

CESM2

2003

2004

F3SM

GEOS