bc-no-season: absolute difference surface flux of SO2 – global surface concentration of SO4 – global surface concentration of SO2 – global surface flux of BC – global surface concentration of BC – global 0.0e+00 emiso2 (kg m-2 s-1) mmrbc (kg kg-1) kg_ so2 (kg kg-1) mmrso4 (kg 2e-11 -3.7e-16 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 – global upwelling shortwave flux at TOA – global upwelling clear-sky longwave flux at TOA - global net radiative flux incident shortwave flux at TOA - global at TOA - global 0.1 0.1 6e-08 rlut + rsut (W m-2) 0.0 0.0 rlutes (W m-2) rsut (W m-2) rsdt (W m-2) 0.025 4e-08 -0.1 -0.1 2e-08 -0.025 -0.3 -0.22001 2003 2001 2003 2001 2003 2001 2003 2001 2002 2003 Year Year Year Year Year upwelling clear–sky shortwave flux at TOA – global clear-sky net radiative dry deposition rate wet deposition rate total deposition rate flux at TOA - global of BC - global of BC - global of BC - global 2.6e-16 6.1e-15 1.2e-15 drybc + wetbc (kg m-2 s-1) rlutcs + rsutcs (W m-2) drybc (kg m-2 s-1) wetbc (kg m-2 s-1) 3.1e-15 -1.6e-15 5.2e-17 -4.4e-15 -0.1 -3 0e-15 -6 0e-15 2003 2002 2003 2001 2003 2001 2003 2004 2001 2002 2003 2001 2001 Year Year Year Year Year wetso4)/3 (kg m-2 s-1) dry deposition rate of SO4 – global total deposition rate of S – global wet deposition rate of SO4 – global dry deposition rate wet deposition rate of SO2 – global of SO2 – global 4.8e-15 5.6e-15 wetso2 (kg m-2 s-1) dryso4 (kg m-2 s-1) (kg m-2 s-1 2.7e-15 + (dryso4 + 5.0e-14 6.9e-16 -3.0e-15 tso4 2e-14 2.5e-14 (dryso2 + wetso2)/2 0.0e+00 0.0e+00 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 Year Year ambient aerosol optical thickness at 550nm – globa convective cloud cover total cloud cover percentage - global -0.025 clt (%) -0.050 -0.05-0.075

emibc (kg m-2 s-1)

-8.1e

0.10

0.05

0.00

-0.05

0.1

0.0

-0.2

-0.3

rsutcs (W m-2) -0.1

dryso2 (kg m-2 s-1)

0.000

-0.025

-0.050

-0.075

2001

2002

Year

2003

2004

-0.10

2001

2002

Year

CESM₁

CESM2

2003

2004

F3SM

GEOS

-0.100

2001

GFDI

GISS

2002

2003

Year

2004

MIROC

NorESM2

OsloCTM3

UKESM

rlut (W m-2)