## bc-no-season: absolute difference surface flux of SO2 – bc–no–season surface flux of BC – bc–no–season surface concentration surface concentration of SO4 – bc–no–season surface concentration of SO2 – bc–no–season 7.4e-15 0.0e+00 1.5e-10 4.9e-15 emibc (kg m-2 s-1) mmrbc (kg kg-1) so2 (kg kg-1) 1.0e-10 mmrso4 (kg 2.5e-15 1.3e-16 5.0e 9.0e-17 3.6e-17 -1.5e-09 0.0e+0.0-2.3e-15 2001 2002 2003 2001 2002 2003 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year upwelling shortwave flux at TOA – bc–no–season upwelling longwave flux at TOA – bc-no-season incident shortwave flux at TOA – bc-no-season upwelling clear-sky longwave flux at TOA - bc-no-seasor net radiative flux at TOA - bc-no-season 3e-07 0.0e + 002e-01 rsut (W m-2) 2e-07 rsut (W m-2) rsdt (W m-2) 2e-01 1e-01 rlutcs (W r -5e-01 -5.0e-01 1e-01 0e+00 0e+00 Ę -7.5e-01 -1e+00 0e+00 -1e-07-1e-01 -1.0e+00 2002 2003 2003 2002 2003 2002 2003 2001 2001 2002 2003 2004 2001 2002 2001 2001 Year Year Year Year Year upwelling clear-sky shortwa clear-sky net radiative dry deposition rate wet deposition rate total deposition rate flux at TOA - bc-no-season flux at TOA - bc-no-seaso of BC - bc-no-season of BC - bc-no-season of BC - bc-no-season 0e+00 0.0e+00 drybc + wetbc (kg m-2 s-1) ·lutcs + rsutcs (W m-2) (kg m–2 s–1) drybc (kg m-2 s-1) 1.0e-15 -5.0e-01 3e-14 -5e-01 2e-14 -1.0e+00 -1e+00 0e+00 -1.5e+00 0e+00 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2003 2002 2003 Year Year Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1) dry deposition rate of SO2 – bc–no–season dry deposition rate of SO4 – bc–no–season wet deposition rate wet deposition rate total deposition rate of SO2 - bc-no-season of SO4 - bc-no-season of S - bc-no-season 2.0e-13 3e-13 wetso2 (kg m-2 s-1) dryso4 (kg m-2 s-1) 5.0e-13 (kg m-2)0e+00wetso4 0.0e+00 0.0e+00 0e+00 -2e-14 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year ambient aerosol optical convective cloud cover percentage – bc-no-season total cloud cover thickness at 550nm - bc-no-se percentage - bc-no-seaso 0.0e+00 0e+00 1e-01 -5.0e-02 cltc (%) clt (%) -1e-01 -1.0e-01 -1e-01 -2e-01 -1.5e-01 2002 2003 2003 2002 2003 Year Year Year

CESM<sub>1</sub>

E3SM

GISS

CESM2

MIROC

NorESM2

**GFDI** 

OsloCTM3

**UKESM** 

**GEOS** 

emibc (kg m-2 s-1)

rlut (W m-2)

rsutcs (W m-2)

dryso2 (kg m-2 s-1)