global: 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 of BC - bc-no-season 9.3e-16 1.5e-14 0e+00 4e-1 emibc (kg m-2 s-1) 5.0e-16 -1e-10 emibc (kg m-2 s-1) kg− nmrbc (kg kg-' (kg kg-1)mmrso4 (kg 6.4e-17 7.2e-15 2e-1 302 -3e-10 -3.7e-16 3.2e-15 00+00 -8.1e-16 2001 2002 2003 2001 2002 2003 2001 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 longwar flux at TOA - bc-no-seaso net radiative flux at TOA - bc-no-season 2e-01 5e-02 2.5e-02 6e-08 rlut + rsut (W m-2) 2e-01 rlutcs (W m-2) rlut (W m-2) rsdt (W m-2) rsut (W m-2) 0e+00 0.0e + 004e-08 1e-01 -2.5e-02 -5e-02 0e+00 2e-08 -1e-00e+00 -1e-012003 2003 2003 2001 2002 2003 2004 2001 2002 2001 2002 2001 2002 2001 2002 2003 Year Year Year Year Year upwelling clear-sky shortway clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - bc-no-season flux at TOA - bc-no-seaso at TOA - bc-no-season of BC - bc-no-season of BC - bc-no-season 3e-01 rlut+rsut-rlutcs-rsutcs(W~m^-2) 2e-02 ·lutcs + rsutcs (W m-2) wetbc (kg m-2 s-1) 2e-01 drybc (kg m-2 s-1) rsutcs (W m-2) 0e+00 1e-01 1e-01 -2e-02 -4e_02 0e+00 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of SO4 – bc–no–season wet deposition rate of SO4 – bc–no–season total deposition rate dry deposition rate wet deposition rate of BC - bc-no-season of SO2 - bc-no-season of SO2 - bc-no-season 1.2e-15 4.8e-15 5.6e-15 2.0e-13 drybc + wetbc (kg m-2 s-1) dryso2 (kg m-2 s-1) wetso2 (kg m-2 s-1) dryso4 (kg m–2 s–1) wetso4 (kg m-2 s-1) -1.6e-15 2.7e-15 1.5e-13 1.0e-13 6.9e-16 5.0e-14 0.0e+00 0e+00-9.9e-15 -1.2e-2002 2003 2001 2002 2003 2001 2002 2003 2001 2003 2001 2003 Year Year Year Year Year convective cloud cover percentage – bc-no-season total deposition rate ambient aerosol optical total cloud cover of S - bc-no-season thickness at 550nm - bc-no-se percentage - bc-no-seaso (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg 0.0e+00 0.0e+00 7.5e-14 -2.5e-02 5.0e-14 -5.0e-02 -5e-02 2.5e-14 -7.5e-02 -1e-01 2002 2003 2002 2003 2002 2003 2002 2003 Year Year Year Year **UKESM** CESM₁ GISS MIROC **GFDI**

E3SM

CESM2

NorESM2

OsloCTM3

GEOS