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 5.0e -1e-10 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ emiso2 $(kg m^{-2} s^{-1})$ mmrso4 (kg kg – 1) mmrbc (kg kg – 1) so2 (kg kg 6.4e-17 7.2e-15 -3.7e-16 3.2e-15 00+00 -8.1e-16 2003 2002 2003 2003 2002 2003 2002 2003 2001 2002 2001 2001 2002 2004 2001 2001 Year Year Year Year Year upwelling longwave flux at TOA – bc-no-season upwelling shortwave flux at TOA – bc–no–season upwelling clear-sky longwa flux at TOA - bc-no-seas net radiative flux incident shortwave flux at TOA - bc-no-season at TOA - bc-no-season 2e-01 2.5e-02 6e-08 -1ut + rsut (W m⁻²) 2e-01 rlutcs (W m-2) rlut (Wm-2)rsut(Wm-2)rsdt(Wm-2)0e+00 1e-01 0.0e+004e-08 1e-01 -2 5e-02 -5e-02 0e+00 0e+00 2e-08 -5.0e-02 -1e-01 0e+00 -1e-01 2003 2003 2003 2003 2004 2001 2002 2003 2004 2001 2002 2001 2002 2001 2002 2004 2001 2002 Year Year Year Year Year upwelling clear–sky shortwav flux at TOA – bc–no–seaso clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - bc-no-season at TOA - bc-no-season of BC - bc-no-season of BC - bc-no-season ر ع 2e-02 rlut + rsut - rlutcs - rsutcs (W rlutcs + rsutcs (W m⁻²) 3.1e-15 2e-01 wetbc $(kg m^{-2} s^{-1})$ rsutcs (W m-2) drybc (kg m^{-2} s⁻¹ 1e-01 1e-01 -2e-02 -4e-02 0e+00 0e+00 -6e-02 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 2004 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 $drybc + wetbc (kg m^{-2} s^{-1})$ -1.6e-15 $dryso2 (kg m^{-2} s^{-1})$ 2.7e-15 wetso2 $(kg m^{-2} s^{-1})$ $dryso4 (kg m^{-2} s^{-1})$ wetso4 (kg m⁻² s⁻¹ 1.5e-13 1.0e-13 -4.4e-15 6.9e-16 5.0e-14 0e+00-9.9e-15 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year convective cloud cover percentage – bc-no-season ambient aerosol optical total deposition rate total cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3thickness at 550nm - bc-no-se percentage – bc-no-seaso 1.0e-13 0.0e+00 0.0e+00 7.5e-14 expression(clt~(%) -2.5e-02 $(kg m^{-2} s^{-1})$ 5.0e-14 -5.0e-02 2.5e-14 -7.5e-02 0.0e+00 -1e-01 2001 2002 2003 2004 2002 2003 2002 2003 2002 2003 Year Year Year Year **UKESM** CESM1 GISS MIROC **GFDI** E3SM NorESM2 OsloCTM3 **GEOS**