global: absolute difference surface flux of BC – bc–no–season surface flux surface concentration surface concentration surface concentration of SO2 - bc-no-season of SO4 - bc-no-season of SO2 - bc-no-seasor 9.3e-16 0e+00 0.00+00 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ Δ mmrbc (kg kg – 1) (kg kg – 1 (kg kg - 1)5.0e Δ emiso2 (kg m $^{-2}$ 6.4e-2e-1 ∆ mmrso4 so₂ (1e-14 -3.7e-16 -1.0e-09 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year upwelling longwave flux at TOA – bc–no–season upwelling clear-sky longwa flux at TOA - bc-no-seas upwelling shortwave flux net radiative flux incident shortwave flux at TOA – bc-no-season at TOA - bc-no-season at TOA - bc-no-season 2e-07 Δ rlut + rsut (W m⁻²) 2e-01 2.5e-02 Δ rlutcs (W m-2) Δ rlut (W m – 2) 1e-07 ∆ rsut (W m – 0e+00 rsdt (W m-0.0e+00 0e+00 -5.0e-02 -4e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year $' m^{-2}$) upwelling clear–sky shortway flux at TOA – bc–no–seasc clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - bc-no-seasc at TOA - bc-no-season of BC - bc-no-season of BC - bc-no-season 2.6e-16 6.1e-15 Ē 2e-01 rsutcs Δ rsutcs (W m – 2) drybc (kg m⁻² s^{-'} rlutcs + rsutcs (W 1e-01 wetbc (kg m⁻² 1e-01 rlutcs -0e+00 -1e-01 -1e-01rsut – -1e-01 -3.0e-15 -2e-0 -2e-01 rlut + 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year dry deposition rate of SO2 – bc–no–seasor wet deposition rate of SO2 – bc–no–seasor dry deposition rate of SO4 – bc–no–season wet deposition rate of SO4 – bc–no–season total deposition rate of BC - bc-no-season 1.2e-15 wetbc (kg m⁻² s⁻ $dryso2 (kg m^{-2} s^{-1}$ wetso2 (kg m⁻² s⁻ ∆ dryso4 (kg m⁻² s⁻ -1.6e-15 $({\sf kg}\,{\sf m}^{-2}$ 1.0e-13 -4.4e-15 2.4e-16 wetso4 5.0e-14 ∆ drybc + -9.9e-15 -5.2e-15 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year dryso2 + wetso2)/2 + (dryso4 + wetso4)/3total cloud cover - bc-no-sea surface cloud cover - bc-no-s total deposition rate ambient aerosol optical convective cloud cover - bc-noof S - bc-no-season thickness at 550nm - bc-no-s 0.0e+00 (percent ∆ clt (percent) 0e+00 5.0e-14 ∆ cltc ۷ دا (2.5e-14 -1.0e-01 -7.5e-02 _1e_01 -1.5e-01-1.0e-01 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year ice water path - bc-no-seas surface concentration column mass burden column mass burden column mass burden of SO4 - bc-no-season of DMS - bc-no-seasor of BC - bc-no-season of SO2 - bc-no-season 4e-04 5.0e-13 Δ loadso4 (kg m⁻²) $\Delta \operatorname{clivi} \left(\operatorname{kg m}^{-2} \right)$ loadbc $({ m kg}~{ m m}^{-2})$ Δ loadso2 (kg m $^{-2}$ ∆ dms (kg kg −1) 3e-04 2e-04 2e-08 3e-07 -5.0e-09 2e-07 1e-04 1e-08 -1.0e-081e-07 0e+00 0e+00 0e+00 -5.0e-13 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year

CAM5

CESM1

CESM2

E3SM

GEOS

GFDL

GISS

MIROC

NorESM2

OsloCTM3

UKESM