## sea: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - bc-no-season of SO2 - bc-no-season of BC - bc-no-season of SO4 - bc-no-season of SO2 - bc-no-season 2e-01 0.00+00 1 00+00 1e-01 -2.5e+01∆ mmrso₄ 2e+00 0e+00 -5.0e+01 5.0e-01 -5.0e+001e+00 -1e-01 -7.5e+00-2e-01 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 shortwave flux at TOA – bc–no–season upwelling clear-sky longway flux at TOA - bc-no-seaso net radiative flux incident shortwave flux at TOA - bc-no-season at TOA - bc-no-season 3e-02 2e-02 5e-08 36\_01 1e-02 rsut 1e-02 ∆ rlutcs 2e-01 ∆ rlut + 0e+00 0e+00 00+00 1e\_01 1e-01 -1e-02 -1e-02 -2e-02 -5e-08 -1e-0 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 Year Year Year Year Year upwelling clear–sky shortwave flux at TOA – bc–no–seasor clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - bc-no-seasor at TOA - bc-no-season of BC - bc-no-season of BC - bc-no-season rsutcs) 0.0e+00 0e+00 1e-01 rsutcs rlutcs -2e-01 2e-01 5e-02 ∆ wetbc ∆ rlutcs + -5.0e+00 -6e+00 1e-0 1e-01 -5e-02 -7.5e+000e+00 0e+00 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 dry deposition rate of SO2 – bc–no–season wet deposition rate of SO2 – bc–no–season dry deposition rate of SO4 – bc–no–season wet deposition rate of SO4 – bc–no–season total deposition rate of BC - bc-no-season 0.0e+004e-01 3e+00 -5.0e+00 ∆ wetso2 1.5e+00 -1.0e+0 0e+00 1.0e+00 1e+00 5.0e-01 0e+00 -2 0e+01 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 $\frac{1}{3} dryso2 + wetso2)/2 + \frac{1}{3} dryso4 + wetso4)/3$ total deposition rate ambient aerosol optical total cloud cover - bc-no-sea convective cloud cover - bc-no-s surface cloud cover - bc-no-se of S - bc-no-season thickness at 550nm - bc-no-se 2e-01 0e+00 1e-01 5e-01 -2e+01 0.0e+0.04e+00 0e+00 0e+00 -4e+012e+00 -1 0e-01 -6e+01 -1e-01 0e+00 -1e+00 -1.5e-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-sease surface concentration column mass burden column mass burden column mass burden of DMS - bc-no-season bc-no-season of SO2 - bc-no-season of SO4 - bc-no-season 3e-01 5.0e+00 4e-01 4e+00 1.5e+0.10.0e+00 2e-01 2e-01 3e+00 1.0e+01 1e-01 2e+00 0e+00 -1.0e+0.10e+00 5.0e+00 1e+00 -1.5e+01 -2e-01 -1e-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 CAM5 E3SM **GISS** OsloCTM3 CESM1 **GEOS** MIROC **UKESM**

CESM2

GFDL

NorESM2