global: percent difference surface flux surface flux surface concentration surface concentration of BC - so2-no-season of SO2 - so2-no-season of SO4 - so2-no-seasor of SO2 - so2-no-season 2e-01 00+00 1.5e+00 -1e+00∆ emibc -1e-021.00+00 2e-01 -1e-0 -2e-02 0e+00 -2e-01 -3e+00 0.0e+0.0-3e-02 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 upwelling clear-sky longway flux at TOA - so2-no-seaso net radiative flux upwelling longwave flux upwelling shortwave flux incident shortwave flux at TOA – so2-no-season at TOA - so2-no-season at TOA - so2-no-season at TOA - so2-no-season 4e-01 3e-08 2e-02 2e-02 3e-01 rsu 2e-08 1e-02 rsut 0e+00 1e-01 0e+00 -2e-02 _08 0e+00 2002 2003 2004 2002 2003 2004 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 Year Year Year Year Year dry deposition rate of BC – so2–no–season upwelling clear-sky shortwave clear-sky net radiative implied cloud response wet deposition rate flux at TOA - so2-no-seaso flux at TOA - so2-no-seaso at TOA - so2-no-seasor of BC - so2-no-season rsutcs) 5.0e-02 2.5e-02 3e-01 rlutcs -3e-01 ∆ rsutcs 0e+00 ∆ rlutcs + 2e-01 0e+00 1e-01 1e-01 -1e-01 -5.0e-02 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 Year Year dry deposition rate of SO2 – so2–no–season wet deposition rate dry deposition rate of SO4 – so2–no–seasor wet deposition rate total deposition rate of BC - so2-no-season of SO2 - so2-no-season of SO4 - so2-no-season 2e-01 1e+00 1e-01 0e+00 1.0e + 0.01e+00 ∆ wetso2 wetso4 0e+00 5.0e-01 -1e-01 -1e+00 56-01 -2e+002000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 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 - so2-no-sea convective cloud cover - so2-nosurface cloud cover - so2-no-se of S - so2-no-season thickness at 550nm - so2-no-s 2e+00 0e+00 1e-01 -2e+01 1e+00 od550ae 0e+00 <u>\</u> 0e+00 0e+00 -1e-01 -6e+01 -1 0e-01 -1e+00 -1.5e-01 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 2000 2001 Year Year Year Year Year ice water path - so2-no-seas surface concentration column mass burden column mass burden column mass burden of DMS - so2-no-season of BC - so2-no-season of SO2 - so2-no-season of SO4 - so2-no-season 3e-01 1.2e+01 4e-01 2e-01 1e-01 9.0e+00 1e-01 oadso4 ∆ loadbc 0e+000e+00 6.0e+00 0e+00-1e-01 -1e+00 -1e-013.0e+0.0-2e-01 -2e-01 -2e+00-2e-01 0.0e + 0.02000 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 CAM5 E3SM **GISS** OsloCTM3 CESM1 GEOS MIROC **UKESM**

CESM2

GFDL

NorESM2