land: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - bc-no-season of SO2 - bc-no-season of SO4 - bc-no-season of SO2 - bc-no-season 1.5e-01 8e+00 0.0e + 006e+00 1e-01 -2.5e+011.0e-01 ∆ emibc -5.0e+01 _1e+00 5.0e-02 20+00 -2e+00 -1e-01 0.0e+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 upwelling clear-sky longwave flux at TOA - bc-no-season incident shortwave flux upwelling longwave flux upwelling shortwave flux net radiative flux at TOA - bc-no-season at TOA - bc-no-season at TOA - bc-no-season at TOA - bc-no-season 5e-01 5.0e-08 1e-01 8e-02 0.0e + 0.00e+00 Δ rsut 5e-02 0.0e+00 rlut + -5.0e-08 -2.5e-0° 0e+00 -5e-01 -1.0e-070e+00 -5.0e-01 -1.5e-07 -5e-02 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 Year Year Year Year Year upwelling clear–sky shortway flux at TOA – bc–no–seaso clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - bc-no-seaso at TOA - bc-no-season of BC - bc-no-season of BC - bc-no-season rsutcs) 5e-01 1e+00 rsutcs 8e+00 0e+00 0e+00 4e-01 ∆ rsutcs ∆ rlutcs + -5e-01 -5e-01 4e+00 2e-01 rsut--1e+00 0e+00 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year 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 1e+01 4e-01 4e+006e+00 ∆ drybc + wetbc 3e+00∆ dryso2 ∆ wetso2 5e+00 4e+00 2e+00 1e+00 0e+00 -1e+000e+00 0e+00 0e+00 -1e+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 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-seasor thickness at 550nm - bc-no-se 4e-01 1.2e + 0.10e+00 -2e+00 -2e+01∆ clt ا کا کا 4.0e+00 -8e-01 -6e+01 -6e+00 0.0e + 0020002001200220032004 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 of BC - bc-no-season of SO2 - bc-no-season of SO4 - bc-no-season 2.0e+00 1.2e+01 4e-01 1e+00 1.5e + 005e-01 8.0e+00 0e+00 1.0e+00 -5e-01 4.0e+00 0.0e + 000.0e+00 -8e-01 -9e+00 -5.0e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year CAM5 E3SM **GISS** OsloCTM3

CESM1

CESM2

GEOS

GFDL

MIROC

NorESM2

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