## bc-no-season: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - SH-land of SO2 - SH-land of BC - SH-land of SO4 - SH-land of SO2 - SH-land 4e-01 5.0e+00 0.00+00 2.5e+00 -2.5e+01mmrso4 8 0e-01 mmrbc ∆ emibc -5.0e+01 0.0e+00 2e+00 -4e-0 -2.5e+00 0e+00 0.0e+00-8e-0 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 Year Year upwelling longwave flux at TOA – SH–land upwelling shortwave flux at TOA – SH–land upwelling clear-sky longwa flux at TOA - SH-land net radiative flux incident shortwave flux at TOA - SH-land at TOA - SH-land 1.5e-01 26-01 5.0e-02 1.0e-01 rsut 0e+00 1e\_01 ∆ rlut + r 2.5e-02 5.0e-02 -5e-080e+00 0.0e + 0.00e+00 0.0e+00-1e-07-2.5e-02 -5.0e-02 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 Year Year Year Year Year dry deposition rate of BC – SH–land upwelling clear–sky shortway flux at TOA – SH–land wet deposition rate of BC – SH–land clear-sky net radiative implied cloud response flux at TOA - SH-land at TOA - SH-land rsutcs) 3e-01 2e-01 4e+01 2e-0 2e-01 rsutcs rlutcs --01 1e-01 ∆ drybc 3e+01 ∆ rsutcs 1e-01 ∆ rlutcs + 0e+00 2e+01 rsut – 0e+00 0e+00 -5e+00 1e+01 -1e-01 $-1e-0^{\circ}$ -2e-0 0e+00 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 Year Year dry deposition rate of SO2 – SH–land dry deposition rate of SO4 – SH–land total deposition rate of BC – SH–land wet deposition rate wet deposition rate of SO4 – SH-land of SO2 - SH-land 4e+01 1e+00 2e+00 4e+00 ∆ drybc + wetbc 3e+01 ∆ dryso2 ∆ wetso2 2e+01 1e+00 1e+01 1e+00 0e+00 0e+00 0e+00 -1e+0 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 - SH-lan convective cloud cover - SHsurface cloud cover - SH-lai of S - SH-land thickness at 550nm - SH-lai 2.5e-01 5.0e-01 0.0e + 0.00.0e+00 od550ae ∆ clt ا کا کا 2.5e+00-5.0e-01 0e+00 \_2 5e\_01 -1.0e+00 0.0e + 00-6e+0 \_1e+00 20002001200220032004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year ice water path - SH-land column mass burden column mass burden column mass burden surface concentration of DMS - SH-land of BC - SH-land of SO4 - SH-land 4e+00 1.5e+01 1e+00 1e+00 3e+00 -5.0e+00 1.0e+01 ∆ clivi 2e+00 0e+00 -1.0e+01 1e+00 5.0e+00 \_1 5e+01 -1e+00 0e+00 -1e+00 0.0e+00 -1e+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 Year Year Year CAM5 E3SM **GISS** OsloCTM3

CESM1

CESM2

**GEOS** 

GFDL

MIROC

NorESM2

**UKESM**