so2-at-height: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - NH-land of SO2 - NH-land of BC - NH-land of SO4 - NH-land of SO2 - NH-land 6e-05 0e+00 -3e+01 4e-05 -1e+002e+01 -4e+01 2e-05 2e+00 -2e+00 -5e+01 0e+00 -6e+01 0e+00 -2e-05 0e+002000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 Year Year upwelling longwave flux at TOA – NH–land upwelling shortwave flux at TOA – NH–land incident shortwave flux at TOA – NH-land upwelling clear-sky longwav flux at TOA - NH-land net radiative flux at TOA - NH-land 2e-07 1e-01 6e-01 1e-07 5e-02 ∆ rlutcs ∆ rlut + 0e+00 2e -6e-02-1e-07 00+00 0e+00 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 upwelling clear-sky shortway flux at TOA - NH-land clear-sky net radiative flux at TOA - NH-land dry deposition rate of BC – NH–land wet deposition rate of BC – NH–land implied cloud response at TOA - NH-land rsutcs) 1.5e+00 8e-01 5e-01 0e+00 rsutcs rlutcs -4e-01 1.0e+00 -2e-01 1.0e + 00∆ rlutcs + -4e-0'0e+00 -5e-01 5 0e-01 rsut -6e-01 -1e+00 0.0e + 0.00.0e+002000 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 total deposition rate of BC – NH–land wet deposition rate of SO2 – NH–land dry deposition rate of SO4 – NH–land dry deposition rate of SO2 – NH–land wet deposition rate of SO4 – NH–land 4e+01 4e+01 2.5e-01 -3e+013e+01 wetso4 0.0e+00 3e+01 -2.5e-02e+01 -5.0e-0 1e+01 -5e+01 0e+00 2000 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 $\frac{1}{3} dryso2 + wetso2)/2 + \frac{1}{3} dryso4 + wetso4)/3$ Year Year total deposition rate ambient aerosol optical total cloud cover - NH-lan convective cloud cover - NH-I surface cloud cover - NH-lai of S - NH-land thickness at 550nm - NH-la 7.5e+01 0.0e + 001.5e+36 5.0e+01 ∆ od550ae. ا کا کا 0.0e + 00_2 5e+01 2.5e+01 -2.5e-01 -5 0e+01 -1e+00 0.0e+0020002001200220032004 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 ice water path - NH-land surface concentration column mass burden column mass burden column mass burden of SO2 - NH-land of DMS - NH-land of BC - NH-land of SO4 - NH-land 6e-01 4e+01 3e+01 1.0e+00 ∆ clivi ∆ loadso ∠ 3e+01 -01 2e+01 -3e-01 0.0e+00 $1e+0^{\circ}$ -5.0e-01 -6e-01 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 Year Year Year CAM5 E3SM **GISS** OsloCTM3 CESM1 **GEOS** MIROC **UKESM** CESM2 GFDL NorESM2