so2-at-height: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - sea of SO2 - sea of BC - sea of SO4 - sea of SO2 - sea 1e-05 6e+00 0e+00 mmrso4 4e+00 ∆ emibc 5e-06 -1e+01 2e+00 00+00 4e-0 5.0e+00 0e+00 -2e+01 -5e-06 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 upwelling longwave flux at TOA – sea upwelling shortwave flux at TOA – sea upwelling clear-sky longwav flux at TOA - sea net radiative flux incident shortwave flux at TOA - sea at TOA - sea 4e-02 4e-01 4e-01 2e-02 ∆ rlutcs 0e+00 2e-01 2e-01 0e+00 1e-01 1e-01 -1e-02-4e-02 0e+00 -2e-02 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year upwelling clear-sky shortwav clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - sea flux at TOA - sea at TOA - sea of BC - sea of BC - sea rsutcs) 6e-01 1.0e+00 1.0e + 0.0rlutcs -7.5e-01 ∆ wetbc -2 5e-01 0e+00rlutcs + 5.0e-01 5 0e-01 0e+00 rsut -5.0e-01 -5e-01 -2e-01 0.0e+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 total deposition rate dry deposition rate wet deposition rate wet deposition rate dry deposition rate of BC - sea of SO2 - sea of SO2 - sea of SO4 - sea of SO4 - sea 1e+00 1.5e + 0.15e+00 wetso2 wetso4 0e+00 1.0e+01 1.0e+01 1.0e+01 -5e-01 5.0e+00 5.0e+00 5.0e+00 -1e+00 -50+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 $\frac{1}{3} dryso2 + wetso2)/2 + \frac{1}{3} dryso4 + wetso4)/3$ total deposition rate ambient aerosol optical total cloud cover - sea convective cloud cover - sea surface cloud cover - sea of S - sea thickness at 550nm - sea 00+00 6e+35 5e+01 1e-01 0e+00 4e+01 -2e+01 4e+35 ∆ ct <u>\</u> 3e+01 -4e+01 -4e-01 2e+35 2e+01 -5e-02 1e+01 _1e_01 0e+00 -8e+01 20002001200220032004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year ice water path - sea surface concentration column mass burden column mass burden column mass burden of BC - sea of DMS - sea of SO2 - sea of SO4 - sea 4e-01 2e-01 3e-01 oadso2 oadso4 0e+00 2e-01 0e+00 1.0e+01 1e-01 -2e-01 5.0e+00 -5e-01 0e+00 5.0e+00 -1e-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 CAM5 E3SM **GISS** OsloCTM3 CESM1 **GEOS** MIROC **UKESM** CESM2 **GFDL** NorESM2