## so2-at-height: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - NH-pacific of SO2 - NH-pacific of BC - NH-pacific of SO4 - NH-pacific of SO2 - NH-pacific 1e+01 7.5e+00 1.50+01 1.0e-05 mmrso4 5.0e+005e-01 $\Delta so2$ 0e+00 1.0e+01 5.0e-06 2.5e+00 0e+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 Year Year upwelling longwave flux at TOA – NH-pacific upwelling shortwave flux at TOA – NH–pacific incident shortwave flux at TOA – NH-pacific upwelling clear-sky longwa flux at TOA - NH-pacific net radiative flux at TOA - NH-pacific 1e-01 6e-01 5e-02 2.5e-02 rsut 5e-08 4e-01 0e+00 ∆ rlut + 0.0e+00 2e-0 0e+00 -2.5e-02 0e+00 -1e-01-5.0e-02 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year upwelling clear–sky shortway flux at TOA – NH–pacific clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TÓA - NH-pacific at TOA - NH-pacific of BC - NH-pacific of BC - NH-pacific rsutcs) 0.0e + 001.5e+00 1.5e+00 rlutcs -\_5 0e\_01 0e+00 rlutcs + 0e+00 rsut 5.0e-01 5 0e-01 -4e-01 0.0e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 Year total deposition rate of BC – NH–pacific dry deposition rate of SO2 – NH–pacific wet deposition rate of SO2 – NH–pacific wet deposition rate of SO4 – NH-pacific dry deposition rate of SO4 - NH-pacific 2e+00 2.5e+01 1.5e+01 ∆ drybc + wetbc 2.0e+01 1e+00 ∆ wetso4 1.5e+0° 5.0e+00 0e+00 1.0e+01 1.0e+01 0.0e + 0.0e +-1e+00 5.0e+00 5.0e+00 -5 0e+00 0.0e + 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 Year Year Year $\frac{1}{3} dryso2 + wetso2)/2 + \frac{1}{3} dryso4 + wetso4)/3$ total deposition rate ambient aerosol optical total cloud cover - NH-pacif convective cloud cover - NH-pa surface cloud cover - NH-pa of S - NH-pacific thickness at 550nm - NH-pa 8e+01 양 ∆ ct -1.0e+00 4e+01 2e+35 -1.5e+00 -5.0e+01 2e+01 -2e-01 0e+00 -2 5e+00 2000 2001 2002 2003 2004 20002001200220032004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year ice water path - NH-pacific column mass burden column mass burden surface concentration column mass burden of SO4 - NH-pacific of DMS - NH-pacific of BC - NH-pacific of SO2 - NH-pacific 2e+00 3e+01 5.0e-01 2e+01 1e+00 5e-01 ∆ loadso4 0e+00 1e+01 0.0e+00 -5e-01 -1e+00 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 **GEOS** MIROC **UKESM** CESM2 **GFDL** NorESM2