## Reference - absolute NH-pacific averages surface flux of BC – NH–pacific surface flux of SO2 – NH–pacific surface concentration of BC – NH–pacific surface concentration of SO2 – NH–pacific surface concentration of SO4 – NH–pacific $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ emiso2 $(kg m^{-2} s^{-1})$ 1e-09 mmrbc (kg kg<sup>-1</sup>) mmrso4 (kg kg<sup>-</sup> $so2 (kg kg^{-1})$ 5.0e-14 2e-10 2002 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2003 Year Year Year Year Year shortwave flux at TOA -NH-pacific net radiative flux at TOA –NH–pacific incident shortwave flux at TOA – NH–pacific clear-sky longwave flux at TOA - NH-pacific longwave flux at TOA -NH-pacific 373.5 -90 -270.0 -340 $rlut + rsut (W m^{-2})$ rlutcs (W m<sup>-2</sup>) rlut $(W m^{-2})$ $-sut (W m^{-2})$ $rsdt (W m^{-2})$ -246 -275.0 -100 -350 -277.5 -250 -355 -280.0 371 2001 2003 2001 2003 2001 2003 2001 2002 2003 2003 Year Year Year Year Year clear-sky shortwave clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - NH-pacific flux at TOA - NH-pacific at TOA - NH-pacific of BC - NH-pacific of BC - NH-pacific -37 rlut + rsut - rlutcs - rsutcs (W m-2) -38 rlutcs + rsutcs (W m<sup>-2</sup>) drybc (kg $m^{-2} s^{-1}$ ) -310 wetbc (kg $m^{-2}$ s<sup>-1</sup> $rsutcs (W m^{-2})$ -39 -315 -41 -320 2003 2001 2003 2001 2003 2001 2003 2001 2003 Year Year Year Year Year dry deposition rate of SO2 – NH–pacific wet deposition rate of SO2 – NH–pacific total deposition rate of BC – NH–pacific wet deposition rate of SO4 – NH–pacific dry deposition rate of SO4 - NH-pacific 1.75e-12 $drybc + wetbc (kg m^{-2} s^{-1})$ wetso2 (kg $m^{-2}$ s<sup>-1</sup>) $dryso2 (kg m^{-2} s^{-1})$ $dryso4 (kg m^{-2} s^{-1})$ wetso4 (kg m<sup>-2</sup> s<sup>-1</sup>) 1 25e-12 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year total deposition rate of S – NH–pacific ambient aerosol optical convective cloud cover total cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3percentage - NH-pacific percentage - NH-pacific 70 0.14 $(kg m^{-2} s^{-1})$ od550aer cltc (%) clt (%) 0.12 20 0 0.08 2002 2002 2003 2004 2003 2004 2002 2003 2004 2003 2001 2001 2002 2001 2001 2004 Year Year Year Year OsloCTM3 CFSM1 F3SM **GFDI** MIROC CESM2 **GEOS GISS** NorESM2 **UKESM**