NH-pacific: absolute difference surface flux of SO2 – high–so4 surface concentration of BC – high–so4 surface concentration of SO4 – high–so4 surface flux of BC – high–so4 surface concentration of SO2 – high–so4 7.6e-21 0.0e+00 -2.5e-12 2.5e-21 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ mmrso4 (kg kg – 1) mmrbc (kg kg – 1) emiso2 (kg m $^{-2}$ s $^{-}$ so2 (kg kg – 1) -5 0e-12 -2.5e-21 -1.0e-13 -7.5e-2 2003 2002 2003 2002 2003 2002 2003 2002 2003 2001 2002 2001 2001 2001 2001 Year Year Year Year Year upwelling longwave flux at TOA – high–so4 upwelling shortwave flux at TOA – high–so4 upwelling clear-sky longwa flux at TOA - high-so4 net radiative flux incident shortwave flux at TOA - high-so4 at TOA - high-so4 1e-01 3e-01 2e-01 5.0e-02 0e+00 2e-07 2e-01 $rsut (W m^{-2})$ rlutcs (W m-2) rlut (W m – 2) rsut(Wm-2)rsdt(Wm-2)2.5e-02 -1e-01 1e-01 0e+00 0.0e+00 0e+00 rlut + 1 _36_01 -2e-01 0e+00 -2.5e-02 -1e-01 -2e-0 2003 2003 2003 2003 2001 2002 2003 2001 2002 2001 2002 2001 2002 2001 2002 Year Year clear-sky net radiative flux at TOA - high-so4 dry deposition rate of BC – high–so4 wet deposition rate of BC – high–so4 upwelling clear-sky shortwa implied cloud response flux at TOA - high-so4 at TOA - high-so4 0.0e+00 2e-01 rsut - rlutcs - rsutcs (W rlutcs + rsutcs (W m^{-2} 1e-01 wetbc $(kg m^{-2} s^{-1})$ drybc (kg m $^{-2}$ s $^{-1}$) rsutcs (W m-2) 0.0e+00 0e+00 -2.5e-02 -2e-01 -5.0e-02 -3e-01 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year total deposition rate of BC – high–so4 dry deposition rate of SO2 – high–so4 wet deposition rate of SO2 – high–so4 dry deposition rate of SO4 – high–so4 wet deposition rate of SO4 – high–so4 3.3e-15 $drybc + wetbc (kg m^{-2} s^{-1})$ 1.2e-15 wetso2 $(kg m^{-2} s^{-1})$ $dryso4 (kg m^{-2} s^{-1})$ $dryso2 (kg m^{-2} s^{-1})$ wetso4 (kg $\mathrm{m}^{-2}~\mathrm{s}^{-1}$ 2001 2002 2003 2002 2003 2002 2003 2002 2003 2002 2003 Year Year Year total deposition rate of S – high–so4 ambient aerosol optical thickness at 550nm – high-s total cloud cover convective cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3percentage - high-so4 percentage - high-so4 0.0e+00 1e-02 2e-01 expression(clt~(%) 5e-03 -2.5e-02 $(kg m^{-2} s^{-1})$ 0.0e+00 -5 0e-02 -5e-03 -5.0e-14 -1e-01 -1e-022001 2002 2003 2004 2002 2003 2002 2003 2002 2003 Year Year Year Year

CESM1

E3SM

GISS

CESM2

MIROC

NorESM2

GFDI

OsloCTM3

UKESM

GEOS