## NH-pacific: absolute difference surface flux surface flux surface concentration surface concentration surface concentration of BC - shp-10p-red-19 of SO2 - shp-10p-red-19 of SO4 - shp-10p-red-195 of SO2 - shp-10p-red-198 of BC - shp-10p-red-195 -2e-12 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ nmrbc (kg kg-1) emiso2 (kg m $^{-2}$ s $^{-1}$ 3.5e-22 nmrso4 (kg kg so2 (kg kg--8.2e-22 -2.0e-21 -3.6e-14 -5e-12 -3 2e-2 -3 7e-14 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 upwelling longwave flux at TOA – shp–10p–red–19 upwelling shortwave flux at TOA – shp–10p–red–195 net radiative flux at TOA – shp-10p-red-198 upwelling clear-sky longway flux at TOA - shp-10p-red-1 incident shortwave flux at TOA – shp–10p–red–19 1.5e-01 $rsut(W m^{-2})$ 1.0e-01 2e-02 5 rlut (Wm-2)rsut (Wm-2)rsdt (Wm-2)rlutcs (W m -0e+00 1e-02 5.0e-02 0.0e + 0.00e+00 0e+00 -5e-02 0.0e + 00-4e-02 -2.5e-02 -1e-02 -5.0e-02 -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 implied cloud response dry deposition rate wet deposition rate upwelling clear-sky shortway clear-sky net radiative flux at TOA - shp-10p-red-1 flux at TOA - shp-10p-red-1 $\rm rsutcs \ (W \ m^{-2})$ at TOA - shp-10p-red-195 of BC - shp-10p-red-19 of BC - shp-10p-red-19 1.6e-16 ·lutcs + rsutcs (W m<sup>-2</sup>) 0e+00 2e-02 rsutcs (Wm-2)4e-02 4.2e-17 vetbc (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ 6.9e-17 drybc (kg $m^{-2} s^{-1}$ rlutcs --4e-03 6.1e-18 0e+00 0e+00 -8e-03 rsut – 4e-02 -3.0e-17 -2e-02 rt H -6.6e-1 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 dry deposition rate of SO4 – shp–10p–red–19 total deposition rate of BC – shp-10p-red-19! dry deposition rate of SO2 – shp–10p–red–19 wet deposition rate of SO2 – shp-10p-red-19 wet deposition rate of SO4 – shp–10p–red–199 -9.5e -1.6e-15 $drybc + wetbc \left( kg \ m^{-2} \ s^{-1} \right)$ wetso4 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ wetso2 (kg $m^{-2}$ s<sup>-1</sup> 9.2edryso2 (kg m<sup>-2</sup> s<sup>-</sup> dryso4 (kg m<sup>-2</sup> s<sup>-′</sup> -2.8e-17 -5.0e-18 -5.1e-15 -1.5e -3.1e--9.0e-18 -8.5e-15 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 dryso2 + wetso2)/2 + (dryso4 + wetso4)/3Ice water path - shp-10p-rainethyl sulphide (DMS) mole fraction - sl total deposition rate cloud cover ambient aerosol optical of S - shp-10p-red-1! percentage - shp-10p-red-19 thickness at 550nm - shp-10p-red-1 expression cltc (%) clivi (kg m<sup>-2</sup>) \_lom lom) smp 2e-02 $(kg m^{-2} s^{-1})$ 0e+00 2.5e-14 0e+00 0.0e+00 -5e-04 -2.3e-14 -2.5e-14 20002001200220032004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 Year Year Year Year Year load load of so4 - shp-10p-red-19 of bc - shp-10p-red-1950 0.0e+00 loadso4 (kg m<sup>-2</sup>) oadbc (kg m<sup>-2</sup>) -4.0e-09 0e+00 -8.0e-09 -5e-12 -1e-11 -1.2e-08 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year