NH-land: absolute difference surface flux surface flux surface concentration surface concentration surface concentration of BC - shp-20p-red-1950 of SO2 - shp-20p-red-198 of SO4 - shp-20p-red-195 of BC - shp-20p-red-1950 of SO2 - shp-20p-red-19 5e-02 -5.0e-02 -8.0e-02 -1e-01 0e+00 0e+00 -8.5e-02 -1.5e-01 -3e-01 -5e-06 -1e-01 -9.5e-02 -4e-01 -2.5e-01 _1e_05 2000 2001 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 Year Year Year Year Year upwelling longwave flux at TOA – shp-20p-red-195 upwelling shortwave flux at TOA – shp-20p-red-195 incident shortwave flux at TOA – shp–20p–red–19! upwelling clear-sky longwav flux at TOA - shp-20p-red-1 net radiative flux at TOA - shp-20p-red-195 5.0e-02 1e-02 rsut 0.0e + 0.0e +0e+00 ij 0e+00 -2 5e-02 -1e-02-5e-03 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 BC – shp–20p–red–1950 upwelling clear-sky shortway clear-sky net radiative implied cloud response wet deposition rate flux at TOA - shp-20p-red-19 flux at TOA - shp-20p-red-19 at TOA - shp-20p-red-195 of BC - shp-20p-red-1950 rsutcs) 2e-02 rsutcs 1e-02 rlutcs-1e-02 ∆ rsutcs △ wetbc △ drybc 0e+00 1e-01 0e+00 0e+00 0e+00 -1e-02 -1e-02 (rlut + -1e-01 -2e-02 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 total deposition rate of BC – shp–20p–red–1950 dry deposition rate of SO2 – shp–20p–red–19 wet deposition rate of SO2 – shp–20p–red–195 dry deposition rate of SO4 – shp–20p–red–195 wet deposition rate of SO4 – shp-20p-red-195 -2e-01 drybc + wetbc 2e-01 -2e-01 ∆ wetso2 wetso4 -1.7e-01 -3e-01 0e+00 0e+00 _1 9e_01 -2e-01 -5e-01 -2.1e-01 -2e-012000 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-20p-Dantethyl sulphide (DMS) mole fraction - sh total deposition rate cloud cover ambient aerosol optical of S - shp-20p-red-19 percentage - shp-20p-red-19 thickness at 550nm - shp-20p-red-1 3e - 010e+00 1e+00 5e-01 expression cltc (%) 2e-01 -1e-01 clivi (kg m⁻²) _lom lom) smp ∆ od550aeı 0e+00 1e-01 -2e-01 0e+00 0e+00 -5e-01 -3e-01 -5e-01 -1e-01 -4e-01 -1e+00 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 2000 2001 Year Year Year Year Year load load of so4 - shp-20p-red-195 of bc - shp-20p-red-1950 -1e-01 $\log \log (\log \, m^{-2})$ oadbc (kg m⁻² 1e-01 -2e-01 -3e-01 0e+00

-4e-01

2000 2001 2002 2003 2004

Year

2000 2001

2002 2003 2004

Year