SH-land: absolute difference surface flux surface flux surface concentration surface concentration surface concentration of BC - shp-20p-red-19 of SO2 - shp-20p-red-19 of BC - shp-20p-red-195 of SO4 - shp-20p-red-195 of SO2 - shp-20p-red-195 0e+00 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ 1e-13 nmrbc (kg kg-1) 2.8e-19 emiso2 (kg m⁻² s⁻ -1.8e-15 so2 (kg kg – 1) nmrso4 (kg kg 0e+00 -3.0e-19 -6e-13 -2e-13 -5.9e-19 -2 9e-15 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year upwelling longwave flux at TOA – shp–20p–red–19 upwelling shortwave flux at TOA – shp–20p–red–19 net radiative flux at TOA – shp-20p-red-198 upwelling clear-sky longway flux at TOA - shp-20p-red-1 incident shortwave flux at TOA – shp–20p–red–19 5.0e-02 7.5e-02 1e-01 1.0e-01 $rsut(W m^{-2})$ 2e-02 5 0e-02 5 rlut (Wm-2)sut (W m – 2) 5e-02 rsdt (Wm-2)rlutcs (W m -2.5e-02 1e-02 0e+00 0.0e + 0.00.0e+00 -5e-02 0e+00 -2 5e-02 _1 0e_01 -1e-02 -1.5e-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 upwelling clear-sky shortwa clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - shp-20p-redflux at TOA - shp-20p-red-1 at TOA - shp-20p-red-19 of BC - shp-20p-red-19 of BC - shp-20p-red-19 rsutcs (W m⁻²) 2.2e-16 1.5e-01 ·lutcs + rsutcs (W m⁻²) 5.0e-03 1.0e-01 rsutcs (W m-2) 1.2e-16 wetbc (kg m^{-2} s⁻¹ drybc (kg m⁻² s⁻ 2e-02 5.0e-02 0.0e+00 rlutcs -5.0e-03 0e+00 -6.6e-17 -1.0e-02 rsut -1.0e-01 -1.5e-0.2_1 6e_16 rit + 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–20p–red–19 dry deposition rate of SO2 – shp–20p–red–19 wet deposition rate of SO2 – shp–20p–red–19 total deposition rate of BC – shp–20p–red–19 wet deposition rate of SO4 – shp–20p–red–199 7.0e-3.5e-16 1.6e-18 $drybc + wetbc \left(kg \ m^{-2} \ s^{-1} \right)$ wetso4 $(kg m^{-2} s^{-1}$ dryso2 (kg m $^{-2}$ s $^{-1}$ -8.8e-18 wetso2 (kg m⁻² s⁻ dryso4 (kg m⁻² s⁻ -7.2e-16 -1.4e-15 -8.4e-19 -2.7e-15 -1.4e-15 -3e-14 -3.2e-15 -3.3e -5.4e-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 Year dryso2 + wetso2)/2 + (dryso4 + wetso4)/3Ice water path - shp-20p-Dembethyl sulphide (DMS) mole fraction - sl total deposition rate cloud cover ambient aerosol optical of S - shp-20p-red-1! percentage - shp-20p-red-1 thickness at 550nm - shp-20p-red-1 5.0e-14 expression cltc (% -3 4e-15 clivi (kg ${\sf m}^{-2}$) _lom lom) smb 2.5e-02 $(kg m^{-2} s^{-1})$ -5.0e-04 2.5e-14 od550aeı 0.0e+00 0.0e+00 -6.1e-15 -2.5e-14 -2.5e-02 -1.5e-03 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year load load of so4 - shp-20p-red-195 of bc - shp-20p-red-1950 -3e-09 $\log \log (\log m^{-2})$ 2e-11 oadbc (kg m⁻² 0e+00 -6e-09 -2e-11 -9e-09

2000 2001 2002 2003 2004

2000 2001 2002 2003 2004

Year