## SH-land: absolute difference surface flux of SO2 – shp–ind–shift surface flux of BC – shp–ind–shift surface concentration of BC – shp-ind-shift surface concentration surface concentration of SO4 - shp-ind-shift of SO2 - shp-ind-shift 2e-13 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ emiso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ nmrbc (kg kg – 1) 3.7e-16 so2 (kg kg – 1) mmrso4 (kg kg 3.0e-19 1.2e-16 2.5e-13 0e+00 0.0e+00 1.4e-19 0e+00 -3 0e-20 \_3 9e\_16 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 Year Year Year Year Year upwelling longwave flux at TOA – shp-ind-shift upwelling shortwave flux at TOA – shp–ind–shift upwelling clear-sky longway flux at TOA - shp-ind-shi net radiative flux incident shortwave flux at TOA – shp-ind-shift at TOA - shp-ind-shift 5 0e-02 1e-01 1e-01 0.0e+00 $m^{-2}$ 5e-02 rlut (Wm-2)rsut (Wm-2)(Wm-2)rsut (W r rlutcs (W m --5 0e-02 56-02 0.0e + 0.0-2e-02 -1.0e-0 0e+00 -5e-02 rsdt -2 5e-02 -1.5e-0\_5e\_02 -1e-01 -4e-02 -2.0e-0 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-ind-shi flux at TOA - shp-ind-shif at TOA - shp-ind-shift of BC - shp-ind-shift of BC - shp-ind-shift rsutcs (W m<sup>-2</sup>) 1.5e-15 1e-0 lutcs + rsutcs (W m $^{-2}$ ) 1.0e-02 0e+00 rsutcs (W m-2) 8.9e-16 drybc (kg $m^{-2} s^{-1}$ vetbc (kg m<sup>-2</sup> s<sup>-</sup> 5e-02 5.0e-03 rlutcs -0e+00 0.0e+00 -4e-02 rsut -5e-02 -5.0e-03 \_3 4e\_16 -8.3e-16 rit + 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 total deposition rate of BC – shp-ind-shift dry deposition rate of SO2 – shp–ind–shift wet deposition rate of SO2 – shp-ind-shift dry deposition rate of SO4 – shp–ind–shift wet deposition rate of SO4 – shp-ind-shift 1.2e-15 1.8e-15 2.8e-18 3.8e-15 $\mathrm{drybc} + \mathrm{wetbc} \, (\mathrm{kg} \, \mathrm{m}^{-2} \, \mathrm{s}^{-1})$ 4e-14 dryso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ wetso2 (kg $m^{-2}$ s<sup>-1</sup> dryso4 (kg m<sup>-2</sup> s<sup>-1</sup> 6.3e-16 wetso4 (kg m<sup>-2</sup> : 3e-14 1.5e-16 -5.7e-16 1.3e-15 -3.7e -8.8e--3.0e-15 -6.5e 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-ind-@imethyl sulphide (DMS) mole fraction total deposition rate cloud cover ambient aerosol optical thickness at 550nm - shp-ind-shif of S - shp-ind-shift percentage - shp-ind-shi 5.0e-02 8 2.5e-02 6.1e-15 clivi (kg ${\sf m}^{-2}$ ) mol mol $(kg m^{-2} s^{-1})$ expression cltc 0.0e+00 od550aeı dms ( -2.5e-02 -5.0e-04 0.0e+00 1.4e-15 -5.0e-02 -7.5e-04 -9.6e-16 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-ind-shift of bc - shp-ind-shift loadso4 (kg m<sup>-2</sup>) 1e-08 oadbc (kg m 0.0e+0.05e-09 -2.5e-11 0e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year