## global: absolute difference surface flux of SO2 – shp–20p–red surface flux of BC – shp–20p–red surface concentration of BC – shp–20p–red surface concentration surface concentration of SO4 - shp-20p-red of SO2 - shp-20p-red 1.1e-19 -2 0e-12 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ nmrbc (kg kg-1) əmiso2 (kg m $^{-2}$ s $^{-1}$ 8.1e-20 -7.0e-12 so2 (kg kg – 1) mmrso4 (kg kg-4.8e-20 -9.0e-12 0e+00 -3.0e-1.4e-20 -3.5e-12 -1 9e-20 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 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–20p–red upwelling shortwave flux at TOA – shp–20p–red upwelling clear-sky longway flux at TOA - shp-20p-re incident shortwave flux at TOA – shp–20p–red net radiative flux at TOA - shp-20p-red 5 0e=02 4e-02 2e-02 -lut + rsut $(W m^{-2})$ rlutcs (Wm-2)rlut (Wm-2)rsut (Wm-2)(Wm-2)1.0e-02 0e+00 2e-02 0.0e + 0.05.0e-03 rsdt \_2e\_02 -5e-02 0e+00 -2 5e-02 0.0e+00 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 implied cloud response dry deposition rate wet deposition rate clear-sky net radiative flux at TOA - shp-20p-re flux at TOA - shp-20p-re at TOA - shp-20p-red of BC - shp-20p-red of BC - shp-20p-red rsutcs (W $m^{-2}$ ) 5.0e-03 4e-02 -4.0e-03 lutcs + rsutcs (W m $^{-2}$ ) rsutcs (W m-2) 6.3e-1 vetbc (kg ${\rm m}^{-2}\,{\rm s}^{-1}$ 2.6e-17 drybc (kg $m^{-2} s^{-1}$ 2e-02 -5.0e-03 rlutcs 0e+00 -1.0e-02 -1.2e-02 -2e-02 rsut -1.5e-02 -1.6e-02 + <u>+</u> 10. 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 SO2 – shp–20p–red dry deposition rate of SO4 – shp–20p–red wet deposition rate of SO4 – shp–20p–red total deposition rate of BC – shp–20p–red wet deposition rate of SO2 – shp–20p–red 4.7e-1 -7.5e-14 -8.2e-18 -6.6e-15 $\mathrm{drybc} + \mathrm{wetbc} \, (\mathrm{kg} \, \mathrm{m}^{-2} \, \mathrm{s}^{-1})$ dryso2 (kg m $^{-2}$ s $^{-1}$ wetso2 (kg m<sup>-2</sup> s<sup>-</sup> 2.0e-17 dryso4 (kg $m^{-2}$ s<sup>-</sup> wetso4 (kg m<sup>-2</sup> -6.1e-18 -1.0e-1 -1.2e-14 -3.3e -8.0e-14 -8.3e--8.5e-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 dryso2 + wetso2)/2 + (dryso4 + wetso4)/3Ice water path - shp-20p-Dimethyl sulphide (DMS) mole fraction total deposition rate cloud cover ambient aerosol optical of S - shp-20p-red percentage - shp-20p-rethickness at 550nm - shp-20p-red 5.0e-03 1.5e-04 clivi (kg ${\sf m}^{-2}$ ) \_lom lom) smb $(kg m^{-2} s^{-1})$ 양 0.0e+0.01.0e-04 od550aer -5.0e-03 5.0e-05 -6.5e-14 0.0e+00 0.0e+00 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 of bc - shp-20p-red 1e-11 loadso4 (kg m<sup>-2</sup>) loadbc (kg m $^{-2}$ ) -2e-080e+00 -1e-11 -3e-08 -2e-1 -4e-082000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year