land: absolute difference surface flux of SO2 – shp–atl–shift surface flux of BC – shp–atl–shift surface concentration of BC – shp-atl-shift surface concentration surface concentration of SO4 - shp-atl-shift of SO2 - shp-atl-shift $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ nmrbc (kg kg – 1) emiso2 (kg m $^{-2}$ s $^{-1}$ 1.8e-19 3.8e-14 so2 (kg kg – 1) nmrso4 (kg kg 2e-13 4.6e-20 0e+00 8.0e-12 -8.8e-20 2.5e -2e-2 8e-14 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-atl-shift upwelling shortwave flux at TOA – shp-atl-shift upwelling clear-sky longway flux at TOA - shp-atl-shif incident shortwave flux at TOA – shp-atl-shift net radiative flux at TOA - shp-atl-shift 5 0e=02 4e-02 -lut + rsut $(W m^{-2})$ 5e-03 rlut (Wm-2)rsut (Wm-2)rsdt (Wm-2)lutcs (W m-2e-02 0e+00 0e+00 0.0e + 0.00e+00 0e+00 -3e-02 -2 5e-02 _2e_02 -5e-02 -1e-02 -4e-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 upwelling clear-sky shortway implied cloud response dry deposition rate wet deposition rate clear-sky net radiative flux at TOA - shp-atl-shif flux at TOA - shp-atl-shif rsutcs (W m^{-2}) at TOA - shp-atl-shift of BC - shp-atl-shift of BC - shp-atl-shift 1e-02 ·lutcs + rsutcs (W m⁻²) 1e-01 rsutcs (W m-2) 1e-02 1.9e-16 vetbc (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ 1.0e-15 drybc (kg $m^{-2} s^{-1}$ 0e+00 7.8e-0e+00 rlutcs -1e-02 0e+00 rsut – -1e-02 -5e-∩2 -2e-02 -8.1e-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 total deposition rate of BC - shp-atl-shift dry deposition rate of SO2 – shp-atl-shift wet deposition rate of SO2 – shp-atl-shift dry deposition rate of SO4 – shp-atl-shift wet deposition rate of SO4 – shp-atl-shift 1.6e-15 $\mathrm{drybc} + \mathrm{wetbc} \, (\mathrm{kg} \, \mathrm{m}^{-2} \, \mathrm{s}^{-1})$ wetso2 $(kg m^{-2} s^{-1})$ dryso2 (kg m $^{-2}$ s $^{-1}$ 1.0e-15 dryso4 (kg m⁻² s^{-′} wetso4 (kg m⁻² 4.6e-16 1.8e-14 9.2e-18 3.3e 8.8e 7.0e-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 dryso2 + wetso2)/2 + (dryso4 + wetso4)/3Ice water path - shp-atl-shimethyl sulphide (DMS) mole fraction total deposition rate cloud cover ambient aerosol optical thickness at 550nm - shp-atl-shift of S - shp-atl-shift percentage - shp-atl-shift 2e-02 0e+00 16_02 clivi (kg m⁻²) lom lom) smb $(kg m^{-2} s^{-1})$ 당 0e+00 od550aeı 2.2e -2e-04 -3e-04 20002001200220032004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 Year Year Year Year Year load load of so4 - shp-atl-shift of bc - shp-atl-shift 2.5e-11 4e-08 $loadso4 (kg m^{-2})$ loadbc (kg m⁻²) 0.0e+00 3e-08 -2.5e-11 2e-08 -5 0e-11 1e-08 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year