## shp-atl-shift: absolute difference surface flux of SO2 – NH–atlantic surface flux of BC – NH–atlantic surface concentration surface concentration of SO4 – NH–atlantic surface concentration of SO2 – NH-atlantic emiso2 $(kg m^{-2} s^{-1})$ mmrso4 (kg kg – 1) nmrbc (kg kg-1) so2 (kg kg – 1) 0e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year upwelling shortwave flux at TOA – NH-atlantic net radiative flux at TOA – NH–atlantic upwelling clear–sky longwa flux at TOA – NH–atlanti incident shortwave flux at TOA – NH–atlantic $rlut + rsut (W m^{-2})$ 5.0e-02 5 2e-01 rsut (Wm-2)rsdt (Wm-2)rlutcs (W m-1e-01 0.0e+00 -2e-01 0e+00 -4e-01 -1e-01\_5 0e\_02 -6e-07 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year clear-sky net radiative implied cloud response at TOA – NH-atlantic dry deposition rate of BC – NH-atlantic wet deposition rate of BC – NH-atlantic rsutcs (W $\mathrm{m}^{-2}$ ) flux at TOA – NH–atlantic 1 0e-14 flutcs + rsutcs (W $m^{-2}$ ) wetbc $(kg m^{-2} s^{-1})$ drybc (kg $m^{-2} s^{-1}$ 2.0e-15 7.2e-15 5e-02 1.2e-15 rlutcs -1e-01 0e+00 4 0e-16 -5e-02 rsut-0e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year dry deposition rate of SO2 – NH-atlantic wet deposition rate of SO2 – NH-atlantic dry deposition rate of SO4 – NH–atlantic wet deposition rate of SO4 – NH-atlantic $dryso2 (kg m^{-2} s^{-1})$ wetso2 (kg m<sup>-2</sup> s<sup>-1</sup>. $dryso4 (kg m^{-2} s^{-1})$ wetso4 (kg m<sup>-2</sup> s<sup>-1</sup>) 0e+00 0e+00 0e+00 0e+002000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year cloud cover Ice water path - NH-atlar@imethyl sulphide (DMS) mole fraction ambient aerosol optical percentage - NH-atlantic thickness at 550nm – NH–atla % 2e-02 dms (mol mol<sup>-1</sup> clivi (kg m<sup>-2</sup>) xpression cltc 0e+00 0e+00 -5e-04 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year load load of so2 NH–atlantic of bc - NH-atlantic oadso2 (kg m<sup>-2</sup>) oadbc (kg m<sup>-2</sup>) 0.0e+00 0e+00-1.0e-07



3.2e-20

2.1e-20

9.8e-21