## shp-60p-red-1950: absolute difference surface flux 3C – NH–atlantic surface flux of SO2 – NH–atlantic surface concentration surface concentration of SO4 – NH–atlantic surface concentration of SO2 – NH-atlantic 4 86-21 -7.0e-12 mmrso4 (kg kg – 1) $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ əmiso2 (kg m $^{-2}$ s $^{-1}$ nmrbc (kg kg-1) \_1 4e\_2 (kg kg - 1)1e-12 -7.6e-2 302 -1 4e-20 0e+00 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 – NH–atlantic upwelling shortwave flux at TOA – NH–atlantic net radiative flux at TOA – NH-atlantic incident shortwave flux at TOA – NH–atlantic upwelling clear-sky longway flux at TOA - NH-atlantic 0e+00 $rsut (W m^{-2})$ rlutcs (W m-2) 5.0e-07 rlut (Wm-2)sut (W m-2)8.0e-01 sdt (Wm-2)2.5e-07 4 0e-01 \_8e\_01 -t H 0.0e+00 0.0e+00 -2.5e-07 -3e-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 shortwav flux at TOA – NH–atlantic clear-sky net radiative implied cloud response dry deposition rate of BC – NH-atlantic wet deposition rate of BC – NH-atlantic flux at TOA - NH-atlantic rsutcs (W $m^{-2}$ ) at TOA – NH–atlantic 2 2e-16 1 2e-15 rlutcs + rsutcs (W m<sup>-2</sup>) rsutcs (W m-2) vetbc (kg m<sup>-2</sup> s<sup>-'</sup> -6.6e-16 drybc (kg m<sup>-2</sup> s<sup>-</sup> 8.0e-01 0e+00 1e-01 0e+00 rsut-0.0e+00 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year total deposition rate 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 of BC – NH–atlantic $drybc + wetbc (kg m^{-2} s^{-1})$ $^{-2}$ s<sup>-1</sup> wetso4 $(kg m^{-2} s^{-1}$ dryso4 (kg m $^{-2}$ s $^{-1}$ -9.5e-16 dryso2 (kg m<sup>-2</sup> . -2 5e-13 1.0e-12 -3.2e-15 5.0e-13 1e-13 -5.5e-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 Year Year dyso2 + wetso2)/2 + (dyso4 + wetso4)/3Ice water path - NH-atlan@imethyl sulphide (DMS) mole fraction total deposition rate of S - NH-atlantic cloud cover ambient aerosol optical thickness at 550nm – NH–atla percentage - NH-atlantic 36-02 \_lom lom) smp 2e-14 clivi (kg m<sup>-2</sup>) $(kg m^{-2} s^{-1})$ 양 2e-02 -2e-04 2e-03 expression 1e-02 0e+00 -2e-14 20002001200220032004 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 SO4 lifetime SO2 lifetime load load load of so2 - NH-atlantic of so4 - NH-atlantic of bc - NH-atlantic - NH-atlantic - NH-atlantic wetso4) (days loadso2/emiso2 (days) oadso4 $(kg m^{-2})$ loadso2 (kg m<sup>-2</sup>) -5e-08 oadbc (kg m<sup>-2</sup>) 0e+00 oadso4/(dryso4+ -1e-07 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2001 2002 2003 2004 2000 2001 2002 2003 Year Year Year Year Year CAM-ATRAS F3SM GISS modelE CESM1 **GEOS** NorESM2