shp-atl-shift-1950: absolute difference surface flux of SO2 – NH–sea surface flux of BC – NH–sea surface concentration surface concentration of SO4 – NH–sea surface concentration of SO2 – NH–sea _1 6e_14 nmrbc (kg kg-1) əmiso2 (kg $\mathrm{m}^{-2} \mathrm{s}^{-1}$ so2 (kg kg – 1) ġ 0.0e+00 ķď -2.6e-14 mmrso4 -5e-13 -6e-13 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 upwelling longwave flux at TOA – NH-sea upwelling shortwave flux at TOA – NH-sea net radiative flux at TOA – NH–sea upwelling clear-sky longwav flux at TOA - NH-sea incident shortwave flux at TOA – NH-sea rlut + rsut $(W m^{-2})$ rlutcs (Wm-2)rsut (W m-2) sdt (Wm-2)0e+00 0e+00 -5e-02 0.0e+00-1e-02 -2e-02 -1e-01 -1e-01 -3e-02 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year upwelling clear-sky shortway flux at TOA - NH-sea clear-sky net radiative flux at TOA - NH-sea implied cloud response dry deposition rate of BC – NH–sea wet deposition rate of BC – NH–sea rsutcs $(W m^{-2})$ at TOA – NH-sea 8 0e-16 m⁻² wetbc (kg m^{-2} s⁻¹) 4.8e-16 drybc (kg m⁻² s⁻ rsutcs (W 1e-02 rlutcs --4.0e-02 -8.0e-02 rsut rlut + 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 total deposition rate of BC – NH–sea dry deposition rate of SO2 – NH–sea wet deposition rate of SO2 – NH-sea dry deposition rate of SO4 - NH-sea wet deposition rate of SO4 – NH–sea 0e+00 9 7e-16 $dryso2 (kg m^{-2} s^{-1})$ wetso2 (kg m⁻² s⁻¹. dryso4 (kg m^{-2} s⁻¹ -2e-05 wetso4 (kg m⁻² -6e-05 -5.9e-15 -8e-05 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 total deposition rate of S – NH–sea cloud cover Ice water path - NH-sea Dimethyl sulphide (DMS) mole fractic ambient aerosol optical percentage - NH-sea thickness at 550nm – NH–se 1.0e-13 1e-04 5.0e-02 m^{-2} _lom lom) smb 0e+00 expression cltc 0.0e+00 clivi (kg ı 2.5e-02 0.0e+00 _3e_04 -4e-04 -2 5e-02 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 load load of so2 - NH-sea of so4 - NH-sea of bc - NH-sea 2e-10 oadbc (kg m⁻²) 1e-09 0e+000e+00 -2e-10 -1e-09

7.1e-21

3.2e-21

-5.9e-22

-4 4e-21

5e-02

0e+00

-5e-02

-1e-01

1e-02

0e+00

-1e-02

8 1e-16

4.7e-16

1.3e-16 -2.0e-16

rlut (Wm-2)

rsutcs (W m-2)

 $drybc + wetbc (kg m^{-2} s^{-1})$

dyso2 + wetso2)/2 + (dyso4 + wetso4)/3

 $(kg m^{-2} s^{-1})$

2e-09

0e+00

-2e-09

 $loadso4 (kg m^{-2})$

-2e-05

-3e-05

Year

Year

Year

Year

Year

load

2000 2001 2002 2003 2004

Year

 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$

