shp-atl-shift-1950: absolute difference surface flux of SO2 – SH–land surface concentration surface concentration of SO4 – SH-land surface concentration of SO2 – SH–land surface flux of BC - SH-land 1.2e-15 2e-12 mmrso4 (kg kg – 1) nmrbc (kg kg-1) əmiso2 (kg $\mathrm{m}^{-2} \mathrm{s}^{-1}$ 9 0e-16 26-13 so2 (kg kg – 1) 0e+00 5.8e-16 2.5e-16 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 longwave flux at TOA – SH–land upwelling shortwave flux at TOA – SH–land net radiative flux at TOA – SH–land incident shortwave flux at TOA – SH-land upwelling clear-sky longway flux at TOA - SH-land 1.5e-01 1e-01 $rsut (W m^{-2})$ rlutcs (Wm-2)1.0e-01 sut (W m - 2)0e+00 5e-02 rsdt (W m – 0e+00 -2e-02 0.0e+00-4e-02 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 upwelling clear-sky shortway flux at TOA - SH-land clear-sky net radiative implied cloud response dry deposition rate of BC – SH–land wet deposition rate of BC – SH–land $^{'}m^{-2})$ flux at TOA - SH-land at TOA - SH-land 3 0e-16 2 6e-15 rsutcs (W rsutcs (W m⁻² 2.5e-02 1.6e-16 vetbc (kg m⁻² s⁻ 1.2e-15 drybc (kg m⁻² s⁻ 0.0e+00 5.0e-02 rlutcs -0.0e+00 rsut--5.0e-02 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 Year total deposition rate of BC – SH–land dry deposition rate of SO2 – SH-land wet deposition rate of SO2 – SH-land dry deposition rate of SO4 – SH-land wet deposition rate of SO4 – SH-land 2 6e-15 1 8e-15 1.3e-14 $dryso2 (kg m^{-2} s^{-1})$ wetso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ dryso4 (kg m⁻² s⁻¹) $^{-2}$ s⁻¹ 0e+00 3.7e-15 -5e-05 -2 0e-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 total deposition rate cloud cover Ice water path - SH-lanc Dimethyl sulphide (DMS) mole fraction ambient aerosol optical percentage - SH-land of S – SH–land thickness at 550nm – SH–lar 0.0e+00 4e-04 8e-14 0.0e+00 dms (mol mol⁻ clivi (kg m⁻²) 양 2e-04 0e+00 -7 5e-02 2000 2001 2002 2003 2004 2003 2004 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 Year Year Year Year Year load load load of so2 - SH-land of so4 - SH-land of bc - SH-land 5e-10 loadso2 (kg m⁻²) oadbc (kg m⁻²) 1e-09 0e+00 -1e-09 -5e-10 -09

1.8e-18

1 3e-18

7.5e-19

2.1e-19

5e-02

0e+00

2e-02

-2e-02

-6e-02

2.5e-15

1.2e-15

-6.4e-1

-1.3e-15

2e-05

0e+00

-2e-05

-4e-05

5.0e-09

0.0e+00

2000 2001 2002 2003 2004

Year

2000 2001

2002 2003 2004

Year

loadso4 (kg m⁻²)

-02

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

rlut (Wm-2)

rsutcs (W m-2)

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

dyso2 + wetso2)/2 + (dryso4 + wetso4)/3

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



2000 2001 2002 2003 2004

Year