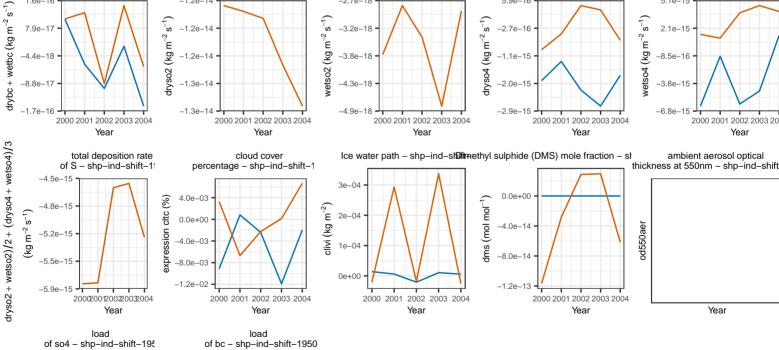
## sea: absolute difference surface flux surface concentration surface concentration surface concentration of SO2 – shp-ind-shift-19 of BC - shp-ind-shift-195 of SO4 - shp-ind-shift-195 of SO2 - shp-ind-shift-19 nmrso4 (kg kg – 1) nmrbc (kg kg-1) so2 (kg kg – 1) \_1 5e\_13 0e+00 0e+00 -2.0e-13 4e-13 -1.2e-14 -8e-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 – shp–ind–shift–19 net radiative flux at TOA – shp-ind-shift-198 upwelling clear–sky longwa flux at TOA – shp–ind–shift– incident shortwave flux at TOA – shp-ind-shift-19 5 0e=02 0.0e+00 $rsut(W m^{-2})$ rlutes (W m-2) 2.5e-02 (Wm-2)-2.5e-03 0.0e + 0.00e+00 0.0e+00 rsdt -2.5e-02 -7.5e-03 -2.5e-02 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - shp-ind-shift-1 at TOA - shp-ind-shift-19 of BC - shp-ind-shift-19 of BC - shp-ind-shift-19 rsutcs (W $m^{-2}$ ) 4e-02 0e+00 8.6e-17 drybc (kg $m^{-2} s^{-1}$ wetbc (kg m<sup>-2</sup> s<sup>-</sup> rlutcs – 4e-03 0e+00 rsut – 2e-02 -3.6e-17 rt H -5.9e-1 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year dry deposition rate of SO4 – shp–ind–shift–19 wet deposition rate of SO4 – shp-ind-shift-19 dry deposition rate of SO2 – shp–ind–shift–19 wet deposition rate of SO2 – shp-ind-shift-19 5.9e-16 wetso2 (kg $\mathrm{m}^{-2} \mathrm{s}^{-1}$ dryso4 (kg m<sup>-2</sup> s<sup>-</sup> wetso4 (kg m $^{-2}$ -3.8e-18 -1.1e-15 -8.5e-16 -6.8e-2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Ice water path - shp-ind-shimethyl sulphide (DMS) mole fraction - sł cloud cover ambient aerosol optical thickness at 550nm - shp-ind-shift-1 0.0e+00 clivi (kg $m^{-2}$ ) lom lom) smb od550aeı 1e-04



surface flux

2000 2001 2002 2003 2004

Year

upwelling longwave flux at TOA – shp-ind-shift-195

2000 2001 2002 2003 2004

Year

upwelling clear-sky shortway flux at TOA - shp-ind-shift-1

2000 2001 2002 2003 2004

Year

total deposition rate of BC – shp–ind–shift–19!

emiso2 (kg m<sup>-2</sup> s<sup>-</sup>

rsut (Wm-2)

·lutcs + rsutcs (W m<sup>-2</sup>)

loadbc (kg m

0e+00

2000 2001 2002 2003 2004

of BC - shp-ind-shift-19!

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

1.0e-2

1.1e-22

4e-02

2e-02

0e+00

-2e-02

4e-03

2e-03

0e+00

-2e-03

1.6e

7.9e-

-4.4e-18

dryso2 + wetso2)/2 + (dryso4 + wetso4)/3

5.0e-09

2.5e-09

0.0e + 0.0e +

2000 2001 2002 2003 2004

Year

 $\log \log (\log m^{-2})$ 

rlut (Wm-2)

rsutcs (W m-2)