shp-ind-shift: absolute difference surface flux of SO2 – NH–land surface flux of BC – NH–land surface concentration surface concentration of SO4 – NH–land surface concentration of SO2 – NH–land 0.0e+00 kg – 1) nmrbc (kg kg – 1) emiso2 (kg m $^{-2}$ s $^{-1}$ so2 (kg kg – 1) ķď 0e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000.02002.52005.02007.5 2000.02002.52005.02007.5 Year Year Year Year Year upwelling longwave flux at TOA – NH–land upwelling shortwave flux at TOA – NH–land net radiative flux at TOA – NH–land incident shortwave flux at TOA – NH–land upwelling clear-sky longwav flux at TOA - NH-land 2.5e-07 5e-02 $rsut (W m^{-2})$ rlutcs (Wm-2)rsut (W m-2) sdt (Wm-2)5e-02 0e+00 00+00 0e+00 -1e-01 -5e-02 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year upwelling clear–sky shortwa flux at TOA – NH–land implied cloud response at TOA – NH-land clear-sky net radiative flux at TOA - NH-land dry deposition rate of BC – NH–land wet deposition rate of BC – NH–land rlutcs - rsutcs (W m⁻²) 2 4e-15 m^{-2} vetbc (kg m^{-2} s⁻¹) 8.6e-16 1.5e-15 drybc (kg m⁻² s⁻ rsutcs (W 0e+00 4 4e-16 rsut – 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 total deposition rate of BC – NH–land dry deposition rate of SO2 – NH-land wet deposition rate of SO2 - NH-land dry deposition rate of SO4 – NH-land wet deposition rate of SO4 - NH-land 1 9e-14 2e-14 8e-02 $dryso2 (kg m^{-2} s^{-1})$ wetso2 (kg m^{-2} s⁻¹. dryso4 (kg m $^{-2}$ s $^{-1}$) wetso4 (kg m $^{-2}$ s $^{-1}$ 8.6e-15 2e-02 3.4e-15 0e+002000 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 ambient aerosol optical total deposition rate of S – NH–land cloud cover Ice water path - NH-land Dimethyl sulphide (DMS) mole fraction thickness at 550nm - NH-la percentage - NH-land 4e-02 6e-04 2e-02 $^{-}$ m $^{-2}$) 0e+00 mol mol 양 od550aeı 0e+00 clivi (kg ı ession -2e-02 -2e-04 0e+00 -4e-02 -3e-04 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 load load load of so2 - NH-land of so4 - NH-land of bc - NH-land 0e+00 oadso2 (kg m⁻²) oadbc (kg m⁻²) 0e+00 -2e-08 -5e-10 -1e-09 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year

NorESM2

6.7e-19

2 0e-19

-2.8e-19 -7.6e-19

1e-01

-1e-01

-2e-01

5.0e-02

0.0e + 00

2 0e-15

1.3e-15 6.0e-16

-1.0e-16

rlut (Wm-2)

rsutcs (W m-2)

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

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

loadso4 (kg m⁻²)

1e-07

5e-08

CAM-ATRAS

CESM1

F3SM

GEOS

GFDI -FSM4

GISS modelE

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

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