shp-ind-shift: absolute difference surface flux of SO2 – indian surface concentration of SO4 – indian surface flux of BC – indian surface concentration surface concentration of SO2 – indian 5 0e-10 nmrbc (kg kg-1) emiso2 (kg m $^{-2}$ s $^{-1}$ 0.0e + 0.00(kg kg – 1) (kg kg--5.0e-10 mmrso4 -1.0e-09 _4e_12 6e--6e-12 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 upwelling longwave flux at TOA – indian upwelling shortwave flux at TOA – indian incident shortwave flux at TOA – indian upwelling clear-sky longway flux at TOA – indian net radiative flux at TOA – indian 6e-01 $rsut (W m^{-2})$ rlutcs (Wm-2)rsdt (Wm-2)rsut (W m-2e-01 -1e-01 0e+00 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 2000 2001 Year Year Year Year implied cloud response at TOA – indian upwelling clear-sky shortway clear-sky net radiative flux at TOA - indian dry deposition rate of BC – indian wet deposition rate of BC – indian rsutcs $(W m^{-2})$ flux at TOA – indian -1utcs + rsutcs (W m⁻²) 3e-01 wetbc (kg m^{-2} s⁻¹) 6.2e-15 drybc (kg m⁻² s⁻ 2e-01 rlutcs -1e-01 1e-01 0e+00 -1e-01 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 total deposition rate of BC – indian dry deposition rate of SO2 – indian wet deposition rate of SO2 – indian dry deposition rate of SO4 – indian wet deposition rate of SO4 – indian 3.0e-12 wetso2 $(kg m^{-2} s^{-1})$ wetso4 $(kg m^{-2} s^{-1})$ dryso2 (kg m $^{-2}$ s $^{-1}$ dryso4 (kg m⁻² 4e-02 2.0e-13 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 total deposition rate of S – indian cloud cover Ice water path - indian Dimethyl sulphide (DMS) mole fractic ambient aerosol optical thickness at 550nm – indiar percentage - indian 6e-02 expression cltc (%) dms (mol mol⁻¹ clivi (kg m⁻²) 4e-02 2e-02 0e+00 6e-03 -1e-03 4e-03 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year SO4 lifetime SO₂ lifetime load load of so2 - indian of so4 - indian of bc - indian - indian indian wetso4) (days loadso2/emiso2 (days) 0.0e + 0.0e +oadso2 (kg m⁻²) oadbc $(kg m^{-2})$ (dryso4 + 1e-08 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2001 2002 2004 2000 2001 2002 2003

Year

GFDI -FSM4

GISS modelE

F3SM

GEOS

Year

NorESM2

Year

1.4e-20

5 40-21

-3.0e-21

-4e-01

-8e-01

rsutcs (Wm-2)

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

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

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

0e+00

-2e-06

-4e-06

-6e-06

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

2e-01

1e-01

9 6e-15

4.9e-15

1.1e-16

-4.6e-15

2000 2001

Year

Year

Year

load

Year

Year

CESM1

CAM-ATRAS

Year

Year

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