shp-30p-red: absolute difference surface flux of SO2 – NH–pacific surface flux of BC – NH–pacific surface concentration surface concentration of SO4 – NH-pacific surface concentration of SO2 – NH–pacific mmrso4 (kg kg-1) nmrbc (kg kg-1) əmiso2 (kg m $^{-2}$ s $^$ so2 (kg kg – 1) 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 upwelling longwave flux at TOA – NH-pacific upwelling shortwave flux at TOA – NH–pacific net radiative flux at TOA – NH-pacific incident shortwave flux at TOA – NH-pacific upwelling clear-sky longway flux at TOA - NH-pacific 1.0e-05 $rsut (W m^{-2})$ 0.0e+00 0e+00 rlutcs (Wm-2)rsut (W m-2) sdt (W m-0e+00 -1.0e-01 rlut + 0.0e+00 -4e-02 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 dry deposition rate of BC – NH–pacific upwelling clear-sky shortway flux at TOA - NH-pacific implied cloud response at TOA – NH–pacific clear-sky net radiative flux at TOA - NH-pacific wet deposition rate of BC – NH-pacific m^{-2} 3.5e-16 rsutcs (W rlutcs + rsutcs (W m⁻² 0.0e+00 2e-02 2.0e-16 vetbc (kg m⁻² s^{-'} 9.6e-16 drybc (kg m⁻² s⁻ 0e+00 rlutcs rsut-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-pacific dry deposition rate of SO2 – NH–pacific wet deposition rate of SO2 – NH–pacific dry deposition rate of SO4 – NH–pacific wet deposition rate of SO4 – NH-pacific wetso4 (kg m⁻² s⁻¹ wetso2 (kg m⁻² s⁻¹ dryso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ dryso4 (kg m $^{-2}$ s $^{-1}$ 3e-02 2e-02 1e-02 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 - NH-pacific cloud cover Ice water path - NH-paciDimethyl sulphide (DMS) mole fraction ambient aerosol optical percentage – NH-pacific thickness at 550nm – NH–pag 2.5e-04 _lom lom) smp clivi (kg m⁻²) expression cltc 0.0e + 00-1e-130e+00 -2e-02 20002001200220032004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year load load of so2 of so4 - NH-pacific of bc - NH-pacific - NH-pacific oadso2 (kg m⁻²) loadbc (kg m⁻²) 5e-10 0e+00 -1.5e-08

2000 2001 2002 2003 2004

Year

GFDI -FSM4

GISS modelE

F3SM

GEOS

NorESM2

8.3e-21

4 86-21

1.4e-21 -2.0e-21

5.0e-02

0.0e+00

-5.0e-02

rsutcs (W m-2)

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

 $\frac{1}{3}$ dryso2 + wetso2)/2 + $\frac{(dryso4 + wetso4)}{3}$

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

-2e-08

-4e-08

-6e-08

loadso4 (kg m⁻²)

1.0e-02 5.0e-03

0.0e + 0.0

-2e-02

1 6e-15

8.5e-16

1.4e-16

-5.7e-16

Year

Year

Year

Year

Year

load

2000 2001 2002 2003 2004

Year

2000 2001 2002 2003 2004

Year

CESM1

CAM-ATRAS

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