shp-60p-red: absolute difference surface flux of SO2 – global surface flux of BC – global surface concentration surface concentration of SO4 – global surface concentration of SO2 – global 1.8e-19 mmrso4 (kg kg-1) nmrbc (kg kg-1) əmiso2 (kg m^{–2} s^{–'} 8.9e-20 (kg kg - 1)-9 0e-12 0.0e+00 -2e-12 -1.2e-11 302 -8.9e-20 -1.5e-1 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000.02002.52005.02007.5 2000.02002.52005.02007.5 2000 2001 Year Year Year Year Year upwelling longwave flux at TOA – global upwelling shortwave flux at TOA – global incident shortwave flux at TOA – global upwelling clear-sky longwa flux at TOA - global net radiative flux at TOA – global 0.0e+00 7.5e-02 0.0e+00 1.0e-02 rlut + rsut (W m⁻²) 5 _5 0e_02 2 rsdt (Wm-2)rlutcs (W m-2e-05 5.0e-03 -sut (W m-2.5e-02 0.0e+00 _1.5e_01 0.0e+00 -5.0e-03 -2 0e-01 -1.0e-02 -2.5e-02 0e+00 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 clear-sky shortway flux at TOA - global implied cloud response at TOA – global clear-sky net radiative flux at TOA - global dry deposition rate of BC – global wet deposition rate of BC – global rsutcs (W m⁻²) 8 0e-15 2 2e-16 0e+00 m^{-2} -1e-02 vetbc (kg m^{-2} s⁻¹) drybc (kg $m^{-2} s^{-1}$ 5.9e-15 1.2e-16 rsutcs (W -5e-02 rlutcs -3.7e-15 -1e-01 1.5e-15 rsut – -4e-02 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year total deposition rate of BC – global dry deposition rate of SO2 – global wet deposition rate of SO2 – global dry deposition rate of SO4 – global wet deposition rate of SO4 – global 7 9e-15 4e-02 $drybc + wetbc (kg m^{-2} s^{-1})$ -2e-14 wetso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ dryso4 (kg m⁻² s⁻¹) dryso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ 3e-02 5.8e-15 vetso4 (kg m⁻² -1.5e-13 3.7e-15 1e-02 1.6e-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 cloud cover total deposition rate of S – global Ice water path - global Dimethyl sulphide (DMS) mole fractic ambient aerosol optical percentage - global thickness at 550nm - glob 2.0e-02 5.0e-03 -6.0e-04 0e+00 $^{-2}$) dms (mol mol⁻¹ 1.5e-02 0.0e+00 ctc clivi (kg r 0e+00 -5.0e-03 expression -1.0e-03 (kg -1.0e-02 5.0e-03 -1.2e-03 0.0e + 0.0e +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 SO4 lifetime SO2 lifetime load load load of so2 - global – global of so4 - global - global of bc - global wetso4) (days -2e-08 oadso2/emiso2 (days) -4e-08 oadso2 (kg m⁻²) oadbc $(kg m^{-2})$ -2e-08 -6e-08 0.0e+00 oadso4/(dryso4+ -3e-08 -8e-08 -2 5e-10 -1e-072000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2001 2002 2003 2004 2000 2001 2002 2003 Year Year Year Year Year NorESM2

CAM-ATRAS

CESM1

F3SM

GEOS

GFDI -FSM4

GISS modelE

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

rlut (Wm-2)

rsutcs (W m-

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

loadso4 (kg m⁻²)