shp-atl-shift: absolute difference surface flux of SO2 – global surface concentration of SO4 – global surface flux of BC – global surface concentration surface concentration of SO2 – global 1.2e-19 1.5e-13 mmrso4 (kg kg – 1) emibc $(kg m^{-2} s^{-1})$ nmrbc (kg kg-1) əmiso2 (kg m $^{-2}$ s $^{-1}$ 7 26-20 0.0e+00 (kg kg - 1)5.0e-14 2.7e-20 0.0e+00 -1.8e-20 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 longwave flux at TOA – global upwelling clear-sky longway flux at TOA - global upwelling shortwave flux at TOA – global net radiative flux at TOA – global incident shortwave flux at TOA – global 5.0e-02 $rsut (W m^{-2})$ 7.5e-02 2 2 5e-02 4e-01 rsdt (Wm-2)rsut (W m - 2)rlutcs (W m -2e-01 5 0e-02 0.0e+00 2e-01 2.5e-02 -2 5e-02 _9e_01 0.0e+00 0e+00 -5.0e-02 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 implied cloud response at TOA – global upwelling clear-sky shortway clear-sky net radiative flux at TOA - global dry deposition rate of BC – global wet deposition rate of BC – global flux at TOA – global rsutcs (W m^{-2}) 0e+00 m⁻² 0.0e+00 rsutcs (W m-2) drybc (kg $m^{-2} s^{-1}$ 5.4e-15 vetbc (kg m⁻² s^{-′} ≥ -1e-0 -1e-01 3.5e-15 rlutcs. -1 0e-01 -2e-01 rsut--2.0e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 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 8 4e-17 drybc + wetbc (kg m⁻² s⁻¹) 0.0e+00 $dryso2 (kg m^{-2} s^{-1})$ wetso2 (kg m^{-2} s⁻¹ 3.8e-17 2e-02 wetso4 (kg m⁻² -8.0e-18 -5.4e-17 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 dyso2 + wetso2)/2 + (dyso4 + wetso4)/3total deposition rate of S – global cloud cover Dimethyl sulphide (DMS) mole fraction Ice water path - global ambient aerosol optical thickness at 550nm – globa percentage - global 4e-14 1e-04 0e+00 1e-02 clivi (kg m⁻²) _lom lom) smb $(kg m^{-2} s^{-1})$ 0e+00 ctc 0e+00 expression -4e-03 -6e-03 -1e-02 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 Year SO4 lifetime SO2 lifetime load load load of so2 of so4 - global – global – global of bc - global global wetso4) (days 2.0e-08 1e-10 loadso2/emiso2 (days) loadso4 (kg m⁻²) 1.5e-08 oadso2 (kg m⁻²) oadbc $(kg m^{-2})$ -2e-07 1.0e-08 (dryso4 + -2e-10 5.0e-09 -4e-07 -3e-10 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2001 2002 2004 2000 2001 2002 2003 Year Year Year Year Year NorESM2 CAM-ATRAS F3SM GFDI -FSM4

CESM1

GEOS

GISS modelE