shp-atl-shift: absolute difference surface flux of BC – NH–atlantic surface flux of SO2 – NH–atlantic surface concentration surface concentration of SO4 – NH–atlantic surface concentration of SO2 – NH–atlantic 3.2e-20 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ mmrso4 (kg kg – 1) emiso $2 (kg m^{-2} s^{-1}$ nmrbc (kg kg-1) 2.1e-20 so2 (kg kg – 1) 0e+00 9.8e-21 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 upwelling longwave flux at TOA – NH–atlantic upwelling shortwave flux at TOA – NH-atlantic upwelling clear–sky longwa flux at TOA – NH–atlanti net radiative flux incident shortwave flux at TOA – NH–atlantic at TOA - NH-atlantic $rsut (W m^{-2})$ 2e-01 5.0e-02 5 rlut (Wm-2)rsut (Wm-2)rsdt (Wm-2)rlutcs (W m-0e+00 0.0e+00 0e+00 -2e-01 -4e-01 -2e-01 _5 0e_02 -6e-07 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 – NH–atlantic upwelling clear–sky shortwa flux at TOA – NH–atlantic clear-sky net radiative dry deposition rate of BC – NH-atlantic wet deposition rate of BC – NH-atlantic rlutcs - rsutcs (W m⁻²) flux at TOA - NH-atlantic 1 0e-14 rlutcs + rsutcs (W m^{-2}) 2e-01 wetbc $(kg m^{-2} s^{-1})$ drybc (kg $\mathrm{m}^{-2}~\mathrm{s}^{-1}$ 2.0e-15 7.2e-15 5e-02 rsutcs (W m-0.0e+00 0e+00 1.2e-15 0e+00 -5.0e-02 -2e-01 4 0e-16 -1.0e-0 -5e-02 rsut – -1.5e-0 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 - NH-atlantic dry deposition rate of SO2 – NH-atlantic wet deposition rate of SO2 – NH-atlantic dry deposition rate of SO4 – NH–atlantic wet deposition rate of SO4 – NH-atlantic $drybc + wetbc (kg m^{-2} s^{-1})$ $\rm dryso2~(kg~m^{-2}~s^{-1})$ wetso2 (kg m⁻² s⁻¹. $dryso4 (kg m^{-2} s^{-1})$ wetso4 (kg m⁻² s⁻¹) 9.1e-15 0e+00 5.4e-15 0e+00 0e+00 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 dyso2 + wetso2)/2 + (dyso4 + wetso4)/3total deposition rate of S – NH–atlantic cloud cover Ice water path - NH-atlar@imethyl sulphide (DMS) mole fraction ambient aerosol optical percentage – NH-atlantic thickness at 550nm – NH–atla 8 2e-02 dms (mol mol⁻¹ clivi (kg m⁻²) $(kg m^{-2} s^{-1})$ cltc od550aeı 0e+00 expression 0e+00 0e+00 5.0e-03 0e+00 -5e-04 0.0e + 0.020002001200220032004 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 SO4 lifetime SO₂ lifetime load load load of so2 - NH-atlantic of so4 - NH-atlantic of bc - NH-atlantic NH–atlantic - NH-atlantic wetso4) (days oadso2/emiso2 (days) loadso4 (kg m⁻²)oadso2 (kg m⁻²) oadbc $({\sf kg}\ {\sf m}^{-2})$ 1.5e-07 0e+00(dryso4+ 1.0e-07 5.0e-08 2000 2001 2002 2003 2004 2002 2003 2004 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