NH-atlantic: absolute difference surface flux surface flux surface concentration surface concentration of BC - high-so4 of SO2 - high-so4 of BC - high-so4 of SO4 - high-so4 of SO2 - high-so4 1.6e-20 00+00 Δ emibc (kg m⁻² s⁻¹) (kg kg - 1) Δ emiso2 (kg m $^{-2}$ s $^{-1}$ Δ so2 (kg kg -1) △ mmrbc (kg kg – -1e-13 1.6e-2 ∆ mmrso4 -5.6e-21 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 upwelling longwave flux at TOA – high–so4 upwelling shortwave flux at TOA – high–so4 incident shortwave flux at TOA – high–so4 upwelling clear-sky longwa flux at TOA - high-so4 net radiative flux at TOA - high-so4 2e-01 5.0e-07 3e-01 0e+00 5.0e-02 rsut (W m Δ rlutcs (W m-2) 2e-0 E 2.5e-07 E 1e-01 ∆ rsdt (W rsut (W 0.0e+00 -4e_01 0.0e+00 ∆ rlut + -6e-01 -2 5e-02 -8e-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 clear-sky net radiative flux at TOA - high-so4 dry deposition rate of BC – high–so4 wet deposition rate of BC – high–so4 upwelling clear-sky shortwa rsutcs (W m^{-2}) implied cloud response flux at TOA - high-so4 at TOA - high-so4 2.1e-15 2.9e-15 Ē wetbc (kg m⁻² s⁻¹) drybc (kg m^{-2} s $^{-1}$ rsutcs (W -2.5e-0 rlutcs --5.0e-01 -5.0e-01 -2e-01 rsut – rlut + 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 wet deposition rate of SO2 – high–so4 dry deposition rate of SO4 – high–so4 wet deposition rate of SO4 – high–so4 total deposition rate of BC – high–so4 dry deposition rate of SO2 – high-so4 3.7e-15 Δ wetso2 (kg m $^{-2}$ s $^{-}$ wetso4 (kg m $^{-2}$ s $^{-}$ dryso2 (kg m⁻² s⁻ 2.5e-15 Δ dryso4 (kg m $^{-2}$ 1.3e-15 2e-13 -2.0e-13 0.0e+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 total deposition rate of S – high–so4 ambient aerosol optical total cloud cover - high-soconvective cloud cover - highthickness at 550nm - high-s ∆ cltc (percent) ∆ clt (percent) (percent) $(kg m^{-2} s^{-1})$ 1e-02 ∆ od550ae -5e-02 0e+00 0e+00 ۷ دا (0e+00 $-1e-0^{\circ}$ -1e-01 -3e-14 -2e-01 -1e-02 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year ice water path - high-so4 surface concentration column mass burden column mass burden column mass burden of DMS - high-so4 of BC - high-so4 of SO2 - high-so4 of SO4 - high-so4 Δ loadso4 (kg m⁻²) $loadbc (kg m^{-2})$ ∆ dms (kg kg –1) ∆ loadso2 (kg m⁻ 4e-07 0e+004e-04 2e-07 -5e-08 0e+00 -1e-092000 2001 2002 2003 2004

 Δ rlut (W m – 2)

 Δ rsutcs (W m – 2)

 Δ drybc + wetbc (kg m⁻² s⁻¹

dryso2 + wetso2)/2 + (dryso4 + wetso4)/3

 $\Delta\,\mathrm{clivi}\,\left(\mathrm{kg}\;\mathrm{m}^{-2}\right)$

Year

