Reference – absolute NH-atlantic averages surface concentration of BC – NH–atlantic surface concentration of SO4 – NH–atlantic surface flux of BC - NH-atlar surface flux of SO2 - NH-atla surface concentration of SO2 – NH-atlantic emibc (kg m-2 s-1) emiso2 (kg m-2 s-1 86-10 mmrso4 (kg kg-1) mmrbc (kg kg-1) so2 (kg kg-1) 5.00e-12 2002 2003 2002 2001 2002 2003 2001 2001 2002 2003 2001 2002 2003 2001 2003 Year Year Year Year Year upwelling longwave flux at TOA – NH–atlantic upwelling shortwave flux at TOA – NH–atlantic incident shortwave flux at TOA – NH-atlantic upwelling clear-sky longwave flux at TOA - NH-atlantic net radiative flux at TOA - NH-atla 256 345 rlut + rsut (W m-2) rlutcs (W m-2) rlut (W m-2) rsdt (W m-2) rsut (W m-2) 252 340 354 273 80 353 335 270 352 2001 2003 2001 2002 2003 2001 2003 2001 2003 2001 2002 2003 Year Year Year Year Year upwelling clear-sky shortwave clear-sky net radiative dry deposition rate wet deposition rate total deposition rate of BC - NH-atlantic flux at TOA - NH-atlantic flux at TOA - NH-atlantic of BC - NH-atlantic of BC - NH-atlantic drybc + wetbc (kg m-2 s-1 rlutcs + rsutcs (W m-2) drybc (kg m-2 s-1) wetbc (kg m-2 s-1) rsutcs (W m-2) 42 310 2003 2003 2003 2001 2003 2001 2002 2001 2002 2003 Year Year Year Year Year · wetso4)/3 (kg m-2 s-1) wet deposition rate of SO4 – NH–atlantic total deposition rate of S – NH–atlantic dry deposition rate wet deposition rate dry deposition rate of SO2 - NH-atlantic of SO2 - NH-atlantic of SO4 - NH-atlantic dryso2 (kg m-2 s-1) wetso2 (kg m-2 s-1) dryso4 (kg m-2 s-1) (kg m-2 s-1)7e-12 + (dryso4 6.0e-12 (dryso2 + wetso2)/2 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 2002 2003 Year Year Year Year ambient aerosol optical thickness at 550nm – NH-atlar convective cloud cover total cloud cover percentage - NH-atlantic 50 0.200 62.5 0.175 60.0 % 30 clt (%) cltc 0.150 57.5 20 55.0 0.125 2003 2002 2003 2002 2003 2004 2002 2004 2001 2004 2001 2001

Year

MIROC

NorESM2

GFDI

GISS

OsloCTM3

UKESM

Year

Year

CFSM1

CESM2

F3SM

GEOS