Reference - absolute NH-sea averages surface flux of BC – NH–sea surface flux of SO2 – NH-sea surface concentration of BC – NH–sea surface concentration of SO4 – NH–sea surface concentration of SO2 – NH–sea 2.0e-13 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ emiso2 (kg $m^{-2} s^{-1}$) mmrbc (kg kg⁻¹ nmrso4 (kg kg⁻ so2 (kg kg⁻¹ 1.0e-13 5.0e-14 2002 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 2001 2001 2002 2003 Year Year Year Year Year shortwave flux at TOA - NH-sea net radiative flux at TOA –NH–sea incident shortwave flux at TOA – NH–sea clear-sky longwave flux at TOA - NH-sea longwave flux at TOA -NH-sea -335 -240 rlut + rsut $(W m^{-2})$ -90 rlutcs $(W m^{-2})$ rlut $(W m^{-2})$ $rsut (W m^{-2})$ $rsdt (W m^{-2})$ -340 -243 -270 -95 353 -246 -273 -100 352 2001 2003 2001 2003 2001 2002 2003 2001 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of BC – NH–sea wet deposition rate of BC – NH-sea clear-sky shortwave clear-sky net radiative implied cloud response flux at TÓA - NH-sea flux at TOA - NH-sea at TOA - NH-sea rlut + rsut - rlutcs - rsutcs (W m-2) 1.6e-13 rlutcs + rsutcs (W m⁻²) $\mathrm{drybc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ wetbc $(kg m^{-2} s^{-1})$ -25 $\rm rsutcs \ (W\ m^{-2})$ -310 -30 -315 -35 -45 -320 2003 2003 2001 2002 2003 2001 2001 2003 2001 2002 2001 2002 2003 Year Year Year Year Year wet deposition rate of SO4 – NH–sea dry deposition rate of SO2 – NH–sea dry deposition rate of SO4 – NH–sea total deposition rate wet deposition rate of BC - NH-sea of SO2 - NH-sea 1.25e $drybc + wetbc (kg \ m^{-2} \ s^{-1})$ wetso2 $(kg m^{-2} s^{-1})$ $\rm dryso2~(kg~m^{-2}~s^{-1})$ $dryso4 (kg m^{-2} s^{-1})$ wetso4 (kg m⁻² s⁻¹) 1.00e 5 00e-12 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 Year Year total deposition rate of S – NH–sea ambient aerosol optical convective cloud cover total cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3thickness at 550nm - NH-sea percentage - NH-sea 8e-12 0.17 69 0.15 $(kg m^{-2} s^{-1})$ od550aer 8 6e-12 clt (%) 0.13 cltc 63 0.11 60 0 2002 2003 2004 2003 2004 2002 2003 2002 2003 2001 2001 2002 2001 2004 2001 2004 Year Year Year Year

CFSM1

CESM2

F3SM

GEOS

GFDI

GISS

MIROC

NorESM2

OsloCTM3

UKESM