## Reference – absolute NH-sea averages surface flux of BC - NH-sea surface flux of SO2 - NH-se surface concentration of BC – NH–sea surface concentration surface concentration of SO4 - NH-sea of SO2 - NH-sea emibc $(kg m^{-2} s^{-1})$ emiso2 (kg $m^{-2} s^{-1}$ ) 6e-14 2.00e mmrso4 (kg kg mmrbc (kg kg<sup>-</sup> so2 (kg kg<sup>-1</sup> 5e-14 5.0e-12 1.75e-10 1.0e-09 4e-14 1.50e-10 9.0e-10 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Yea Year Year clear-sky longwave flux at TOA - NH-sea longwave flux at TOA - NH-s shortwave flux at TOA - NH-s net radiative flux at TOA - NHincident shortwave flux at TOA - NH-sea -340.0 -237.5 354.8 -240.0 -100 rlut + rsut $(W m^{-2})$ $rlut \left( W \; m^{-2} \right)$ $rsut (W m^{-2})$ rlutcs $(W m^{-2})$ $rsdt (W m^{-2})$ -242.5 -101 -345.0 -266 354.4 -245.0 -102 -267 -347.5354.2 -247.5 -350.0 354.0 -104 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2001 2002 2003 2004 Year Year clear-sky shortwave flux at TOA - NH-sea clear-sky net radiative flux at TOA - NH-sea dry deposition rate of BC – NH–sea wet deposition rate of BC – NH–sea implied cloud response at TOA - NH-sea rlutcs - rsutcs (W m<sup>-2</sup>) -39.5 rlutcs + rsutcs (W m<sup>-2</sup>) wetbc $(kg m^{-2} s^{-1})$ drybc (kg $m^{-2}$ s<sup>-1</sup>) $rsutcs (W m^{-2})$ -38 3.0e-13 -306 2.5e-13 rlut + rsut --307 -40.5 2.0e-13 -308 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year total deposition rate of BC – NH–sea dry deposition rate of SO2 – NH–sea wet deposition rate of SO2 – NH-sea dry deposition rate of SO4 – NH–sea wet deposition rate of SO4 – NH–sea 1.981294e-15 5e-13 6.8e-12 $drybc + wetbc (kg m^{-2} s^{-1})$ dryso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ wetso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ $dryso4 (kg m^{-2} s^{-1}$ wetso4 (kg $m^{-2}$ s<sup> $^{-1}$ </sup> 1.1e-11 6.4e-12 1.909117e-15 6.2e-12 9.0e-12 6.0e-12 8.0e-12 1.836940e 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year total deposition rate (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3of S - NH-sea $(kg m^{-2} s^{-1})$ 7.0e-12 6.5e-12 20002001200220032004 Year