## Reference – absolute SH-sea averages surface flux of BC - SHsurface flux of SO2 - SH-se surface concentration surface concentration surface concentration of BC - SH-sea of SO4 - SH-sea of SO2 - SH-sea 2.083006e-14 1.706820e emiso2 $(kg m^{-2} s^{-1})$ emibc $(kg m^{-2} s^{-1})$ 4e-12 mmrso4 (kg kg mmrbc (kg kg so2 (kg kg<sup>-1</sup>) 9.0e-12 9.544462e-15 6.0e-12 5.782595e-15 2002 2003 2004 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 Year Year Year Year Year clear-sky longwave flux at TOA - SH-sea longwave flux at TOA - SH-se shortwave flux at TOA - SH-se net radiative flux at TOA - SHincident shortwave flux at TOA - SH-sea -239 -335 -96 340.5 -241 rlut + rsut $(W m^{-2})$ -261.0 $rsut (W m^{-2})$ $rlut (W m^{-2})$ -340 rlutcs (W m<sup>-2</sup>) -98 $rsdt (W m^{-2})$ 340.4 -243 -261.5 -100 340.3 -345 -245 -262 O -102 340.2 -350 -247 -262.5 2000 2001 2002 2002 2003 2004 2002 2003 2002 2003 2004 Year Year clear-sky shortwave flux at TOA - SH-sea clear-sky net radiative flux at TOA - SH-sea implied cloud response at TOA – SH–sea dry deposition rate of BC – SH–sea wet deposition rate of BC – SH–sea 2.408584e-14 -38.50 rlutcs - rsutcs (W m<sup>-2</sup>) rlutcs + rsutcs (W m<sup>-2</sup>) -38.75 1.900399e wetbc $(kg m^{-2} s^{-1})$ -300 $\rm rsutcs \, (W \, m^{-2})$ drybc (kg ${\rm m}^{-2}\,{\rm s}^{-1}$ -40 -39.00 1.392214e-14 -301 rlut + rsut -8.840294e -39.50 3 758444e-15 2000 2001 2002 2003 2004 2003 2004 2002 20002001200220032004 2002 2003 2004 2000 2001 2002 2000 2001 2003 2004 2000 2001 Year Year Year Year Year total deposition rate of BC – SH–sea dry deposition rate of SO2 – SH-sea wet deposition rate of SO2 – SH–sea dry deposition rate of SO4 – SH–sea wet deposition rate of SO4 - SH-sea 1.039699e-15 3.8e-12 5.0e-12 $drybc + wetbc (kg m^{-2} s^{-1})$ $dryso2 (kg m^{-2} s^{-1})$ wetso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ dryso4 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ wetso4 (kg m<sup>-2</sup> s<sup>-</sup> 6.0e-13 1.0e-13 9.825021e-16 4.0e-12 8.0e-14 5.5e-13 3.5e-12 9.539038e-16 6.0e-14 4.0e-14 9 253056e 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)/3- SH-sea $(kg m^{-2} s^{-1})$ 3.5e-12 20002001200220032004

Year