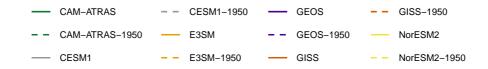
Reference – absolute arctic averages surface flux of SO2 - arctic surface concentration surface flux of BC - arctic surface concentration surface concentration of BC - arctic of SO4 - arctic of SO2 - arctic 1.0e-09 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ əmiso2 (kg m $^{-2}$ s $^{-1}$ mmrbc (kg kg⁻¹) mmrso4 (kg kg⁻ $so2 (kg kg^{-1})$ 5.0e-10 1.0e-11 2.5e-14 2002 2003 2004 2002 2003 2004 2002 2003 2004 2002 2003 2004 Year Year Year Year Year longwave flux at TOA - arctic clear-sky longwave flux at TOA - arctic shortwave flux at TOA - arctic net radiative flux at TOA - arct incident shortwave flux at TOA – arctic -195 -90 $rlut + rsut (W m^{-2})$ -208 $rsut (W m^{-2})$ rlut $(W m^{-2})$ 100 rlutcs (W m^{-2}) $rsdt (W m^{-2})$ -200 _95 -212 -205 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 Year Year Year clear-sky shortwave flux at TOA - arctic clear-sky net radiative flux at TOA – arctic dry deposition rate of BC – arctic implied cloud response at TOA – arctic wet deposition rate of BC – arctic rsut - rlutcs - rsutcs (W m⁻²) 1.5e-13 ·lutcs + rsutcs (W m⁻²) -280 wetbc (kg $\mathrm{m}^{-2} \mathrm{s}^{-1}$) rsutcs $(W m^{-2})$ drybc (kg m⁻² s⁻ -285 -290 -295 -80 rlut + 2000 2001 2002 2003 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year wet deposition rate of SO2 – arctic dry deposition rate of SO4 – arctic total deposition rate of BC – arctic dry deposition rate of SO2 – arctic wet deposition rate of SO4 – arctic 0.008 $drybc + wetbc (kg \ m^{-2} \ s^{-1})$ wetso4 $(kg m^{-2} s^{-1})$ vetso2 (kg m⁻² s⁻¹ dryso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ dryso4 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ 0.006 0.004 0.002 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2001 2002 2003 2004 Year Year Year Year Year total deposition rate of S – arctic (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 $(kg m^{-2} s^{-1})$ 0.002 0.001 0.000 2000 2001 2002 2003 2004



Year