so2-at-height: absolute difference surface flux of SO2 – arctic surface flux surface concentration surface concentration of BC - arctic of BC - arctic of SO4 - arctic of SO2 - arctic 0.0e+00 $\mathrm{emibc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ əmiso2 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ mmrbc (kg kg-1) mmrso4 (kg kg-1) so2 (kg kg – 1) 0e+00 -1.0e-10 1.6e-19 3.2e-20 -2.0e-10 -9.9e-20 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year upwelling longwave flux at TOA – arctic upwelling shortwave flux at TOA – arctic incident shortwave flux upwelling clear-sky longwa flux at TOA - arctic net radiative flux at TOA – arctic at TOA – arctic 0e+00 1e-01 1.0e-01 $rsut(W m^{-2})$ rlutes (W m-2) 5.0e-02 rlut (Wm-2)0e+00 rsut (Wm-2)rsdt (Wm-2)-4e-01 -2e-07 0e+00 rlt + -6e-01 -6e-01 -4e-07 -1.5e-01 -8e-01 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2000 2001 2000 2001 Year Year Year Year upwelling clear-sky shortway flux at TOA - arctic clear-sky net radiative flux at TOA - arctic dry deposition rate of BC – arctic wet deposition rate of BC – arctic implied cloud response at TOA - arctic rlutcs - rsutcs (W m⁻²) 2e-01 0e+00 0e+00 rsutcs (W m⁻²) 2.8e-16 wetbc (kg $\mathrm{m}^{-2} \mathrm{s}^{-1}$) 5.8e-16 $\mathrm{drybc}\,(\mathrm{kg}\,\mathrm{m}^{-2}\,\mathrm{s}^{-1})$ 0e+00 rsutcs (W m-2) -2e-01 -2e-01 -2e-0° -3e-01- rsut -_4e_01 를 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year dry deposition rate of SO2 – arctic total deposition rate of BC – arctic wet deposition rate of SO2 – arctic dry deposition rate of SO4 – arctic wet deposition rate of SO4 – arctic 6e-13 $drybc + wetbc (kg m^{-2} s^{-1})$ wetso2 $(kg m^{-2} s^{-1})$ dryso4 (kg m⁻² s⁻¹ wetso4 (kg $\mathrm{m}^{-2} \mathrm{s}^{-1}$ dryso2 (kg m $^{-2}$ s $^{-1}$ 5.0e-13 -8.0e-16 0e+00 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year total deposition rate of S – arctic ambient aerosol optical total cloud cover convective cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3thickness at 550nm - arctic percentage - arctic percentage - arctic expression clt (%) $(kg m^{-2} s^{-1})$ 0e+00양 od550aer 2e-13 2e+35 expression 0e+00 1e+35 0e+00

