arctic: absolute difference surface flux surface flux surface concentration surface concentration surface concentration of BC - shp-ind-shift-1950 of SO2 - shp-ind-shift-195 of BC - shp-ind-shift-1950 of SO4 - shp-ind-shift-19! of SO2 - shp-ind-shift-19 4e-05 5.0e-01 1e-02 2e-01 2.5e-01 0.0e+00 16-01 2e-05 ∆ emiso2 ∆ emibc 0.00+00 **so2** -1e-01 0e+00 -2.5e-01 -1e-02-1 0e+00 -2e-01 -5.0e-01 -2e-05 -1.5e+00 2000 2001 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 Year Year Year Year Year upwelling longwave flux at TOA – shp-ind-shift-195 upwelling shortwave flux at TOA – shp–ind–shift–195 incident shortwave flux at TOA – shp-ind-shift-19 upwelling clear-sky longwav flux at TOA - shp-ind-shift-1 net radiative flux at TOA - shp-ind-shift-195 5.0e-02 2e-02 2e-01 1e-02 2e-01 1e-02 rsut 1e_01 1e-01 0e+00 0.0e + 000e+00∆ rlut -0e+00 0e+00-1e-02 -1e-02 -2 5e-02 -1e-0 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 clear-sky shortway implied cloud response dry deposition rate wet deposition rate clear-sky net radiative flux at TOA - shp-ind-shift-1! flux at TOA - shp-ind-shift-19 at TOA - shp-ind-shift-195 of BC - shp-ind-shift-1950 of BC - shp-ind-shift-195 rsutcs) 1e-01 4e-01 2e-01 1e-01 rsutcs 5e-02 rlutcs -2e-01 1e-01 ∆ rsutcs 1e-0 △ drybc rlutcs + -1e-01 0e+00 rsut -2e-01 0e+00 -2e-01 į -1e-01 -1e-0 2000 2001 2002 2003 2004 2000 2001 2002 2003 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year total deposition rate of BC – shp-ind-shift-1950 dry deposition rate of SO2 – shp–ind–shift–19 wet deposition rate of SO2 – shp-ind-shift-195 dry deposition rate of SO4 – shp–ind–shift–195 wet deposition rate of SO4 – shp-ind-shift-19 2.5e-01 4e-01 0.0e+0.0-2e-01 drybc + wetbc 0.0e+00 -5.0e-02 ∆ dryso4 0e+000e+00 -2.5e-01 -5e-01 -4e-01 -5.0e-01 -6e-01 -2.0e-01 -7.5e-01 -2.5e-012000 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 dryso2 + wetso2)/2 + (dryso4 + wetso4)/3total deposition rate Ice water path - shp-ind-sDiffnethyl sulphide (DMS) mole fraction - sł cloud cover ambient aerosol optical of S – shp-ind-shift-19 percentage - shp-ind-shift-1 thickness at 550nm - shp-ind-sh 2.5e-01 -2.0e-01 5.0e-01 5e-0° 8 -2.5e-01 2.5e-01 clivi (kg m⁻²) _lom lom) smb 당 0.0e+00 2.5e-0° ∆ od550aei -3.0e-01 0.0e+00 0e+00 -2.5e-01 -3.5e-01 -5e-01-2.5e-01 0.0e+00 -5.0e-01 -4.0e-01 -1e+00-7 5e-01 20002001200220032004 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 load load of so4 - shp-ind-shift-19 of bc - shp-ind-shift-1950 1e-01 loadso4 (kg m⁻²) 5.0e-01 oadbc (kg m⁻²) 0e+00 2.5e-01 0.0e+00 -1e-01

-2.5e-01

2000 2001 2002 2003 2004

Year

-2e-01

2000 2001 2002 2003 2004