## shp-ind-shift-1950: absolute difference surface flux surface flux surface concentration surface concentration surface concentration of BC - arctic of BC - arctic of SO2 - arctic of SO4 - arctic of SO2 - arctic 4e-05 5.0e-01 1e-02 2e-01 2 50-01 0.0e+00 16-01 ∆ emibc ∆ emiso2 0.00+00 0e+00 -1e-01 -2.5e-01 -1 0e+00 -2e-01 -5.0e-01 -1.5e+00 2000 2001 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 Year Year Year Year Year upwelling longwave flux at TOA – arctic upwelling shortwave flux at TOA – arctic incident shortwave flux at TOA – arctic upwelling clear-sky longwav flux at TOA - arctic net radiative flux at TOA – arctic 5.0e-02 2e-01 1e-02 2e-01 1e-02 rsut 16-01 1e-01 0e+00 0.0e + 0.0e +0e+00∆ rlut -0e+00 0e+00 -1e-02 -2 5e-02 -1e-0 -5.0e-02 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 clear-sky net radiative implied cloud response dry deposition rate wet deposition rate upwelling clear-sky shortway flux at TOA - arctic flux at TOA - arctic at TOA - arctic of BC - arctic of BC - arctic rsutcs) 1e-01 4e-01 2e-01 1e-01 rsutcs 5e-02 rlutcs -2e-01 1e-01 1e-01 ∆ rsutcs △ drybc rlutcs+ 0e+00 -2e-01 -2e-01 ₹ 1e-01 -1e-01 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 dry deposition rate of SO4 – arctic total deposition rate of BC – arctic dry deposition rate of SO2 – arctic wet deposition rate of SO2 – arctic wet deposition rate of SO4 – arctic 2.5e-01 4e-01 0.0e+0.0-2e-01 drybc + wetbc 0.0e+00 -5.0e-02 ∆ dryso4 0e+00 0e+00 -2.5e-01 -5e-01 -4e-01 -5.0e-01 -6e-01 -2.0e-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 $\frac{dyso2 + wetso2}{2 + (dyso4 + wetso4)/3}$ total deposition rate Dimethyl sulphide (DMS) mole fract cloud cover Ice water path - arctic ambient aerosol optical of S - arctic thickness at 550nm - arcti 1e+00 2.5e-01 -2.0e-01 5.0e-01 -2.5e-01 2.5e-01 clivi (kg $m^{-2}$ ) \_lom lom) smp 0.0e+00 양 2.5e-0° -3.0e-01 0.0e+00 0e+00 -3.5e-01 -5e-00.0e+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 - arctic of bc - arctic 1e-01 loadso4 (kg m<sup>-2</sup>) 5.0e-01 loadbc (kg m<sup>-2</sup>) 0e+00 2.5e-01 0.0e+00 -1e-01 -2.5e-01 -2e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year