## shp-30p-red: absolute difference surface flux of SO2 – arctic surface concentration surface concentration of SO4 – arctic surface concentration of SO2 – arctic 1.0e-13 nmrbc (kg kg-1) so2 (kg kg – 1) \$ ķď 0.0e+00 -5.0e-14 -9.0e-1 2000 2001 2002 2003 2004 2000.02002.52005.02007.5 2000.02002.52005.02007.5 2000 2001 2002 2003 2004 Year Year Year Year upwelling shortwave flux at TOA – arctic net radiative flux at TOA – arctic incident shortwave flux at TOA – arctic upwelling clear-sky longwav flux at TOA - arctic $rsut (W m^{-2})$ 1e-01 rlutcs (Wm-2)(Wm-2)0e+00 sdt ( rlut + 1 \_02 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year clear-sky net radiative flux at TOA - arctic implied cloud response dry deposition rate wet deposition rate of BC – arctic rlutcs - rsutcs (W m<sup>-2</sup>) at TOA – arctic of BC - arctic 2 0e-16 6 1e-16 1e-01 vetbc (kg $m^{-2} s^{-1}$ ) 3.3e-16 lrybc (kg m<sup>-2</sup> s<sup>-</sup> 0e+00 1e-0 rsut – rlut + 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year dry deposition rate of SO2 – arctic wet deposition rate of SO2 – arctic dry deposition rate of SO4 – arctic wet deposition rate of SO4 – arctic 0.0e+00 wetso4 (kg m $^{-2}$ s $^{-1}$ vetso2 (kg $m^{-2}$ s $^{-1}$ dryso4 (kg $\mathrm{m}^{-2}\,\mathrm{s}^{-1}$ 7.5e-03 0e+00 5.0e-03 2.5e-03 0.0e+002000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year cloud cover Ice water path - arctic Dimethyl sulphide (DMS) mole fract ambient aerosol optical percentage - arctic thickness at 550nm - arctic 0e+00 clivi (kg ${\sf m}^{-2}$ ) \_lom lom) smp 5e-05 0e+00 0.0e+00 -5e-05 -5e-04 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year SO4 lifetime SO<sub>2</sub> lifetime load load of so2 of bc - arctic arctic arctic - arctic wetso4) (days 0e+00-4e-08

