shp-atl-shift-1950: absolute difference surface concentration of BC – land surface flux surface flux surface concentration surface concentration of SO2 - land of BC - land of SO4 - land of SO2 - land 2e-05 4.0e-01 1.4e-01 2.5e-01 0e+00 1e-05 3.5e-01 1.3e-01 2.0e-01 -5e-02 3.0e 0e+00 1.26 1.1e-01 2000 2001 2000 2001 2002 2003 2004 2000 2001 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 – land upwelling shortwave flux at TOA – land net radiative flux at TOA – land incident shortwave flux at TOA – land upwelling clear-sky longwav flux at TOA - land 5.0e-02 1e-02 0e+00 3e-02 ∆ rlut + rsut 5e-02 ∆ rsut -1e-02 0.0e + 0.0e +-2e-02 -5e-03 0e+00 -2 5e-02 -3e-02-3e-02-1e-022000 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 clear-sky net radiative implied cloud response dry deposition rate wet deposition rate flux at TOA - land flux at TOA - land at TOA - land of BC - land of BC - land rsutcs) 5.0e-02 5e-02 2e-02 rsutcs rlutcs -2.5e-02 Δ rsutcs 56-03 0e+001e-02 △ wetbc △ drybc 0.0e+00 0e+00 0e+00 0e+00 rsut -5e-02 -1e-022000 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 wet deposition rate of SO2 – land dry deposition rate of SO4 – land wet deposition rate of SO4 – land total deposition rate of BC – land dry deposition rate of SO2 – land 2e-01 2.0e-01 1e-01 5.0e-01 drybc + wetbc 1.5e-01 ∆ dryso2 wetso4 2.5e-01 2e-01 0e+00 2.5e-01 1 0e-01 -1e-01 1e-01 0.0e+00 1.5e-01 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 $\frac{dryso2 + wetso2}{2 + (dryso4 + wetso4)/3}$ Ice water path - land Dimethyl sulphide (DMS) mole fract total deposition rate cloud cover ambient aerosol optical of S - land thickness at 550nm - land 5e-01 5e-01 1.5e-01 clivi (kg m^{-2}) _lom lom) smb expression cltc 0e+00 4e-01 1.0e-01 ∆ od550ae 0.0e+00 3e-01 5.0e-02 -5e-01 0.0e+00 -1e+0020002001200220032004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year load load of so4 - land of bc - land 4e-01 $loadso4 (kg m^{-2})$ loadbc (kg m⁻²) 3e-01 0e+00 -5e-02 1e-01 -1e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year

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