## land: absolute difference surface flux surface flux surface concentration surface concentration surface concentration of BC - shp-20p-red-1950 of SO2 - shp-20p-red-198 of BC - shp-20p-red-1950 of SO2 - shp-20p-red-195 of SO4 - shp-20p-red-195 -7.5e-02 -1e-01 1e-05 -8.0e-02 $\Delta so2$ -1e-05 \_8.5e\_02 -3e-01 \_2e\_01 -2e-05 -4e-01 -3e-05 2000 2001 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 Year Year Year Year Year upwelling longwave flux at TOA – shp-20p-red-195 upwelling shortwave flux at TOA – shp–20p–red–19! upwelling clear-sky longwar flux at TOA - shp-20p-redincident shortwave flux at TOA – shp-20p-red-19! net radiative flux at TOA - shp-20p-red-195 5.0e-02 1e-02 5.0e-03 0e+00 0.0e+00 rlut + I -2e-02 0.0e + 0.0e +0.0e+00 0e+00 -2 5e-02 -2.5e-03 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 BC – shp–20p–red–1950 upwelling clear-sky shortway clear-sky net radiative implied cloud response wet deposition rate flux at TOA - shp-20p-red-19 flux at TOA - shp-20p-red-19 at TOA - shp-20p-red-195 of BC - shp-20p-red-1950 rsutcs) 1e-02 1e-02 1e-01 ∆ rlutcs + rsutcs 0e+00 rlutcs -0e+00 5e-02 ∆ rsutcs 0e+00 ∆ drybo 00+00 -2e-02 rsut 0e+00-4e-02 -1e-02 -4e-02(rlut + -5e-02 -2e-02 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 Year Year Year Year Year total deposition rate of BC – shp–20p–red–1950 dry deposition rate of SO2 – shp–20p–red–19 wet deposition rate of SO2 – shp–20p–red–195 dry deposition rate of SO4 – shp–20p–red–195 wet deposition rate of SO4 – shp-20p-red-195 1e-01 5e-02 2e-01 -2e-01 drybc + wetbc ∆ wetso2 0e+00 -3e-01 -5e-02 -1 9e-01 -2e-01 -4e-01 -1e-01 -4e-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 - shp-20p-Deichethyl sulphide (DMS) mole fraction - sh total deposition rate cloud cover ambient aerosol optical of S - shp-20p-red-19 percentage - shp-20p-red-1 thickness at 550nm - shp-20p-red-1 -1e-01 clivi (kg m<sup>-2</sup>) \_lom lom) smb expression cltc 0e+00 -2e-01 ∆ od550ae 0.0e+00 2.5e-02 -3e-01 -5e-01 0.0e+00 -4e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 Year Year Year Year Year load load of so4 - shp-20p-red-195 of bc - shp-20p-red-1950 -1e-01 $\log \log (\log \, m^{-2})$ loadbc (kg m<sup>-2</sup>) 1e-01 -3e-01 0e+00 -4e-01 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004

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