## so2-at-height: percent difference surface flux of SO2 – NH–atlantic surface concentration of BC – NH–atlantic surface flux of BC – NH–atlantic surface concentration of SO4 – NH–atlantic surface concentration of SO2 – NH–atlantic 9% 0.25% 4e-06% 20% 6% 0% 2e-06% mmrso4 15% $\Delta so2$ 3% 10% -2e-06% 5% -4e-06% 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year Year net radiative flux at TOA – NH–atlantic incident shortwave flux at TOA – NH-atlantic clear-sky longwave flux at TOA - NH-atlantic longwave flux at TOA shortwave flux at TOA -NH-atlantic NH-atlantic 9e-08% 0.05% 0.6% 6e-08% ∆ (rlut + rsut) 0.5% -0.01% ∆ rsut -0.02% 0.2% 0% -0.03%0% -0.04% 2001 2002 2003 2001 2003 2003 2003 2001 2002 2003 Year Year Year Year Year clear-sky shortwaveflux clear-sky net radiative implied cloud response dry deposition rate wet deposition rate at TOA - NH-atlantic flux at TOA - NH-atlantic at TOA - NH-atlantic of BC - NH-atlantic of BC - NH-atlantic 0.6% 2% $\Delta$ (rlut + rsut - rlutcs - rsutcs) $\Delta$ (rlutcs + rsutcs) 0.3% 1.5% △ wetbc -0.5% 1% 0.5% -0.8% -0.3% 0% 2001 2003 2001 2003 2001 2003 2001 2003 2001 2002 2003 Year Year Year Year Year wet deposition rate of SO4 – NH–atlantic total deposition rate dry deposition rate wet deposition rate dry deposition rate of BC - NH-atlantic of SO2 - NH-atlantic of SO2 - NH-atlantic of SO4 - NH-atlantic 25% 20% 20% 20% ∆ dryso2 ∆ wetso2 ∆ wetso4 ∆ dryso4 0% 15% 15% 10% -5% -10% 5% 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year Year total deposition rate of S – NH–atlantic ambient aerosol optical total cloud cover convective cloud cover percentage - NH-atlantic percentage - NH-atlantic 0.2% 0% 6e+35% -20% ∆ od550aer ∆ clt 4e+35% -40% -0.2% 2e+35% -60% -80%

∆ emibc

0%

-0.05%

1.5%

0.5%

0%

0.5%

0%

-0.5%

∆ (drybc + wetbc)

 $\Delta (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3$ 

25%

20%

10%

2001

2002

2003

Year

2004

∆ rsutcs

∆ rlut

