## so2-at-height: percent difference surface flux of SO2 – NH–sea surface concentration of BC – NH–sea surface flux of BC – NH–sea surface concentration of SO4 – NH–sea surface concentration of SO2 – NH–sea 0.25% 7.5% 0% ∆ emiso2 ∆ mmrso4 4e-06% ∆ emibc $\Delta so2$ 2e\_06% -0.5% -20% 0% 0% -0.75% 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–sea clear-sky longwave flux at TOA - NH-sea longwave flux at TOA shortwave flux at TOA incident shortwave flux NH-sea NH-sea at TOA - NH-sea 0.05% 2e-08% 0.6% 0.6% $\Delta$ (rlut + rsut) 0% 0.4% ∆ rsdt ∆ rlut -0.05% -0.02% 0% -08% -0.03% 2001 2002 2003 2001 2002 2003 2002 2003 2002 2003 2002 2003 Year Year Year Year Year dry deposition rate of BC – NH–sea clear-sky shortwaveflux clear-sky net radiative implied cloud response wet deposition rate at TOA - NH-sea flux at TOA - NH-sea at TOA - NH-sea of BC - NH-sea 0.5% 0.5% $\Delta$ (rlut + rsut - rlutcs - rsutcs) 1.5% 1.5% $\Delta$ (rlutcs + rsutcs) 0.25% ∆ rsutcs △ wetbc -0.5% 1% 0% 0.5% 0.5% -0.5% -0.25% 2001 2003 2001 2003 2003 2001 2003 2001 2003 Year Year Year Year Year total deposition rate of BC – NH–sea dry deposition rate of SO4 – NH–sea dry deposition rate wet deposition rate wet deposition rate of SO2 - NH-sea of SO2 - NH-sea of SO4 - NH-sea 16% 20% ∆ (drybc + wetbc) 0.5% ∆ dryso2 ∆ wetso2 ∆ wetso4 ∆ dryso4 15% 0% -0.5% 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2004 Year Year total deposition rate ambient aerosol optical convective cloud cover $\Delta (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3$ total cloud cover thickness at 550nm - NH-se percentage - NH-sea percentage - NH-sea 0.15% 6e+35% 0% ∆ od550ae 0.05% 20% 4e+35% -40% 15% 2e+35% -0.05% 10% -60% 0% 2002 2003 2002 2001 2003 2001 2004 2002 2003 2004 2001 2003 2004 2002 2004 2001 Year Year Year Year

OsloCTM3

UKESM

CFSM1

E3SM

**GFOS** 

**GISS** 

MIROC

NorESM2