bc-no-season: percent difference surface flux of SO2 – NH–land surface concentration of BC – NH–land surface concentration of SO4 – NH–land surface flux of BC – NH–land surface concentration of SO2 – NH–land 0.4% 0.0012% 0% 0.3% 6% -25% 0.2% ∆ emiso2 Δ emibc ∆ mmrbc ∆ mmrso4 4% 0.1% -75% 0% -0.1 -100% 2001 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year Year longwave flux at TOA -NH-land net radiative flux at TOA – NH–land incident shortwave flux at TOA – NH–land clear-sky longwave flux at TOA - NH-land shortwave flux at TOA -NH-land 0.15% 1e-07% 0.1% 0.1 ∆ (rlut + rsut) 56-08% 0.05% -0.4% ∆ rlut -0.4% 0.05% -0.8% -0.8% -0.05% -5e-08% 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of BC – NH–land wet deposition rate of BC - NH-land clear-sky shortwaveflux clear-sky net radiative implied cloud response at TOA - NH-land flux at TOA - NH-land at TOA - NH-land 0% 0% 0.75% 4% 0% ∆ (rlutcs + rsutcs) -0.5% ∆ (rlut + rsut - rlutcs --0.5% ∆ rsutcs △ wetbc 0.5% -1% 0.25% -1.5% 0% 0% 2001 2003 2004 2001 2003 2003 2001 2002 2003 2001 2003 2001 Year Year Year Year Year total deposition rate of BC – NH–land dry deposition rate of SO4 – NH–land wet deposition rate of SO4 – NH–land dry deposition rate wet deposition rate of SO2 - NH-land of SO2 - NH-land 5% 6% ∆ (drybc + wetbc) 0.2% ∆ dryso2 ∆ wetso2 ∆ dryso4 ∆ wetso4 2% 2.5% 0% 0% 0% 0% -0.2% 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 total deposition rate of S – NH–land ambient aerosol optical convective cloud cover $\Delta \left(\text{dryso2} + \text{wetso2} \right) / 2 + \left(\text{dryso4} + \text{wetso4} \right) / 3$ total cloud cover thickness at 550nm - NH-lan percentage - NH-land percentage - NH-land 0.2% 0% 0% -20% -40% -0.6% -0.4%-0.6% -0.9% 2002 2003 2003 2003 2004 2002 2001 2004 2002 2004 2001 2002 2001 2003 2004 2001 Year Year Year Year

CFSM1

CESM2

F3SM

GEOS

GFDI

GISS

MIROC

NorESM2

OsloCTM3

UKESM