bc-no-season: percent difference surface flux of SO2 – SH–land surface concentration of BC – SH–land surface concentration of SO4 – SH–land surface flux of BC – SH–land surface concentration of SO2 – SH–land 0.4% 0% 1.2% 2.5% -25% 0% 0.8% ∆ emibc ∆ mmrbc ∆ mmrso4 -0.4% 0.4% -75% -2.5% -100% -0.8% 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 – SH–land incident shortwave flux at TOA – SH–land clear-sky longwave flux at TOA - SH-land longwave flux at TOA shortwave flux at TOA -SH-land SH-land 2.5e-08% 0.15% 0.04% 0.2% 0.1% 0.02% ∆ (rlut + rsut) 0.1% ∆ rlut 0.05% -2.5e-08% 0% 0% 0% -0.02% -0.05% -7.5e-08% 2003 2001 2003 2001 2003 2002 2003 2002 2003 Year Year Year Year Year dry deposition rate of BC – SH–land wet deposition rate of BC – SH-land clear-sky shortwaveflux clear-sky net radiative implied cloud response at TOA - SH-land flux at TOA - SH-land at TOA - SH-land 0.3% (rlut + rsut - rlutcs - rsutcs) 40% 0.2% ∆ (rlutcs + rsutcs) 30% 0% ∆ drybc 0.1 20% -5% 10% -0.1% 0% 0% 0% 2003 2001 2003 2001 2003 2001 2003 2002 2001 2002 2003 Year Year Year Year Year total deposition rate of BC – SH–land dry deposition rate of SO4 – SH–land wet deposition rate of SO4 – SH–land dry deposition rate wet deposition rate of SO2 - SH-land of SO2 - SH-land 40% 2% 0.8% ∆ (drybc + wetbc) 30% 0% ∆ dryso2 ∆ wetso2 ∆ wetso4 ∆ dryso4 20% 0.4% 10% 0% 0% 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year total deposition rate of S – SH–land ambient aerosol optical convective cloud cover $\Delta (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3$ total cloud cover percentage - SH-land percentage - SH-land 0.25% 0.5% 0% -20% ∆ od550aer 1% ∆ clt -40% 0% -0.25% -60% -1.5% 2003 2002 2003 2002 2001 2002 2003 2004 2002 2004 2001 2004 2001 2003 2004 2001 Year Year Year Year OsloCTM3 CFSM1 F3SM **GFDI** MIROC CESM2 GEOS **GISS** NorESM2 **UKESM**