## bc-no-season: percent difference surface flux of SO2 – SH–sea surface concentration of BC – SH–sea surface concentration of SO4 – SH–sea surface flux of BC – SH–sea surface concentration of SO2 – SH–sea 0% 0.02% 1.5% -25% 0.01% ∆ emiso2 ∆ mmrso4 0% ∆ mmrbc ∆ emibc 0% 0.5% -0.2% -75% -10% -0.01% 0% -100% 2001 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year net radiative flux at TOA – SH–sea clear–sky longwave flux at TOA – SH–sea longwave flux at TOA shortwave flux at TOA incident shortwave flux SH-sea SH-sea at TOA - SH-sea 0.06% 2e-08% 0.05% 0.04% 0.05% 0.005% $\Delta$ (rlut + rsut) 0% 1e-08% ∆ rlut 0.02% 0% 0% -0.05% 0% 0% -0.005% -0.05% -0.1% -0.02% -08% 2001 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 2004 2002 2003 Year Year Year Year Year dry deposition rate of BC – SH–sea wet deposition rate of BC – SH-sea clear-sky shortwaveflux clear-sky net radiative implied cloud response at TOA - SH-sea flux at TOA - SH-sea at TOA - SH-sea $\Delta$ (rlut + rsut - rlutcs - rsutcs) 0.05% 0.1% 0.1% ∆ (rlutcs + rsutcs) ∆ rsutcs △ wetbc △ drybc -0.05% 0.05% 0.05% -10% -10% -0.1% -15%0% -20% 2001 2003 2001 2003 2001 2002 2003 2001 2003 2001 2002 2003 Year Year Year Year Year total deposition rate of BC – SH–sea dry deposition rate of SO4 – SH-sea wet deposition rate of SO2 – SH-sea wet deposition rate of SO4 – SH–sea dry deposition rate of SO2 - SH-sea 0% ∆ (drybc + wetbc) ∆ dryso2 ∆ wetso2 ∆ wetso4 -10% 0% 0.5% -20% 0% -0.5% -30% -0.4% 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year total deposition rate ambient aerosol optical convective cloud cover $\Delta \left( \text{dryso2} + \text{wetso2} \right) / 2 + \left( \text{dryso4} + \text{wetso4} \right) / 3$ total cloud cover of S - SH-sea thickness at 550nm - SH-se percentage - SH-sea percentage - SH-sea 0% 0.05% 1% -20% 0.1% 0% ∆ od550aeı 0.5% △ cltc -40% -0.05% 0% -60% -0.1% -80% -0.15% 2002 2002 2003 2002 2001 2003 2004 2002 2003 2004 2001 2004 2001 2003 2004 2001 Year Year Year Year OsloCTM3 CFSM1 F3SM **GFDI** MIROC CESM2 GEOS **GISS** NorESM2 **UKESM**