bc-no-season: percent difference surface flux of SO2 – bc–no–season surface flux of BC – bc–no–season surface concentration surface concentration of SO4 – bc–no–season surface concentration of SO2 – bc–no–season of BC - bc-no-season 0.3% 0% 4% 0.2% -25% 0.1% Percent Percent Percent Percent 1% _4% 0% -50% -0.1%1% 0.5% _75% -0.2%0% -8% -0.3% 2001 2002 2003 2001 2002 2003 2001 2003 2004 2001 2002 2003 2001 2002 2003 Year Year Year Year Year upwelling longwave flux at TOA – bc–no–season upwelling shortwave flux at TOA – bc–no–season upwelling clear-sky longwav flux at TOA - bc-no-seaso net radiative flux incident shortwave flux at TOA - bc-no-season at TOA - bc-no-season 0.05% 0.2% 6e-08% 0.025% 0% 0.1% 0.1% Percent Percent Percent Percent -0.01% 0% 0% -0.025% 2e-08% -0.02% -0.05%-0.1% 0% -0.03% -0.075% 2004 2003 2003 2004 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2004 2001 2002 Year Year Year Year upwelling clear-sky shortway clear-sky net radiative dry deposition rate wet deposition rate total deposition rate flux at TOA - bc-no-seaso flux at TOA - bc-no-season of BC - bc-no-season of BC - bc-no-season of BC - bc-no-season 0.15% 0.15% 0.1% -5% 0% 0.1% Percent Percent Percent 0.05% 0.05% -10% -5% -15% -0.05 -0.05% 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of SO4 – bc–no–season dry deposition rate wet deposition rate wet deposition rate total deposition rate of SO2 - bc-no-season of SO2 - bc-no-season of SO4 - bc-no-season of S - bc-no-season 0.4% 0.1% 0% 0% Percent Percent Percent Percent 2% -0.2% 0% 1% -0.2% -0.4% 0% -0.25% 2001 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2004 2002 2003 Year Year Year Year ambient aerosol optical total cloud cover convective cloud cover thickness at 550nm - bc-no-sea percentage - bc-no-seasor percentage - bc-no-season 0% -20% 0.1% Percent Percent 0.1% Percent 0% 0% -60% -0.1% -80% 2002 2003 2002 2001 Year Year Year **UKESM** CFSM1 GISS MIROC **GFDI**

E3SM

CESM2

NorESM2

OsloCTM3

GEOS