so2-at-height: percent difference surface flux of BC – sea surface flux of SO2 – sea surface concentration of BC – sea surface concentration of SO4 – sea surface concentration of SO2 – sea 6e-06% 0.6% 0% 0.4% 3e-06% 0% Percent Percent Percent Percent 0.2% 0% -20% -10% -30% -3e-06% -0.2% 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year Year upwelling longwave flux at TOA – sea upwelling shortwave flux at TOA – sea upwelling clear–sky longwav flux at TOA – sea net radiative flux incident shortwave flux at TOA - sea at TOA - sea 0.4% 0.02% 0.2% 0.02% 0% 1e-08% 0.01% Percent Percent Percent -0.2% 0% -0.4% 0% -0.5% -1e-08% -0.02% -0.6% -0.01% -0.75% 2001 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2002 2003 Year Year Year Year Year upwelling clear-sky shortwave clear-sky net radiative dry deposition rate wet deposition rate total deposition rate flux at TOA - sea flux at TOA - sea of BC - sea of BC - sea of BC - sea 0.5% 0% 0.75% 0.25% 0% -0.5% Percent Percent 0.5% Percent Percent 0.5% -0.25% 0.25% 0% -1.5% -0.5% 0% 2003 2003 2003 2001 2002 2001 2001 2003 2001 2003 2001 2002 Year Year Year Year Year dry deposition rate wet deposition rate dry deposition rate wet deposition rate total deposition rate of SO2 - sea of SO2 - sea of SO4 - sea of SO4 - sea of S - sea 0% 10% 0% 0% 0% Percent Percent Percent Percent -10% -20% -20% -20% -20% -40% -30% -30% -30% -20% 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year Year Year Year Year ambient aerosol optical total cloud cover convective cloud cover thickness at 550nm - sea percentage - sea percentage - sea 0.1% 200% 0% 0.05% Percent -0.1% Percent 100% 0% -0.3% -0.4% -0.05% 0% 2001 2002 2003 2002 2002 2003 2004 2001 2003 2004 2001 2004 Year Year Year NorESM2 CESM1 GISS

E3SM

MIROC

OsloCTM3