so2-at-hgt: absolute difference surface flux of BC - land surface flux of SO2 - land surface concentration of BC – land surface concentration of SO4 - land 3.1e-19 1.3e-14 6e-13 2.0e-19 emiso2 (kg m-2 s-1) emibc (kg m-2 s-1) mmrso4 (kg kg-1) mmrbc (kg kg-1) 2e-13 9.0e-20 6.1e-15 0e+00 -2.2e-20 2.8e-15 -2e-13 -1.3e-19 -6.1e-16 2001 2003 2003 2001 2002 2003 2001 2003 2002 2001 2002 Year Year Year Year upwelling longwave flux at TOA – land upwelling shortwave flux at TOA – land net radiative flux at TOA - land surface concentration of SO2 - land 0.3 0.10 -1.0e-09 m-2rsut (W m-2) so2 (kg kg-1) ulut + rsut (W m rlut (W m-2) 0.05 -1.4e-09 0.00 -1.8e-09 0.0 -0.05 0.0 2001 2002 2003 2001 2002 2001 2002 2001 2002 Year Year Year Year upwelling clear-sky longwave flux at TOA - land upwelling clear-sky shortwave flux at TOA – land clear-sky net radiative flux at TOA – land incident shortwave flux at TOA - land 6e-08 0.25 -0.01 0.20 rlutes + rsutes (W m-2) -0.02 3e-08 rsutcs (W m-2) rlutcs (W m-2) rsdt (W m-2) 0.15 -0.03 0e+00 0.10 -0.04 0.05 -3e-08 -0.05 0.00 0.0 -0.06 -6e-08 2004 2004 2004 2001 2004 2001 2002 2003 2001 2002 2003 2001 2002 2003 2002 2003 Year Year Year Year dry deposition rate of BC – land wet deposition rate of BC – land total deposition rate dry deposition rate of BC - land of SO2 – land 3.3e-15 3.8e-16 1.5e-16 drybc + wetbc (kg m-2 s-1) drybc (kg m-2 s-1) dryso2 (kg m-2 s-1) wetbc (kg m-2 s-1) 1.7e-15 -2.2e-15 -8.5e-16 -3.0e-12 8.5e-16 -1.5e-15 2.8e-17 -4.6e-15 -2.1e-15 2001 2003 2001 2003 2001 2003 2003 2002 2002 2002 2001 2002 Year Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1) wet deposition rate dry deposition rate wet deposition rate total deposition rate of SO2 - land of SO4 - land of SO4 - land 1.0e-12 0e+00 dryso4 (kg m-2 s-1) wetso2 (kg m-2 s-1) 1.5e-13 wetso4 (kg m-2 s-1) 4e-12 7.5e-13 3e-12 1.0e-13 2e-12 2.5e-13 -3e-13 1e-12 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 Year Year Year Year CESM1 E3SM MIROC NorESM2