## global: absolute difference surface concentration of BC – high–so4 surface flux of BC – high–so4 surface flux of SO2 – high–so4 surface concentration of SO4 – high–so4 surface concentration of SO2 – high–so4 -3.8e+00 0e+00 1.5e+01 -1e+00 1.3e+01 -2e+00 ∆ mmrso4 ∆ mmrbc -4.2e+00 1.1e+0.1-4 5e+00 -4e+00 -5e+00 00+00 2003 2002 2003 2003 2002 2003 2002 2003 2001 2002 2001 2002 2004 2001 2001 2001 Year Year Year Year Year upwelling longwave flux at TOA – high–so4 upwelling shortwave flux at TOA – high–so4 net radiative flux at TOA – high–so4 incident shortwave flux at TOA – high–so4 upwelling clear-sky longway flux at TOA - high-so4 3e-08 0e+00 3e-01 0.0e+002e-01 ∆ rlut + rsut 2e-08 ∆ rsut ∆ rsdt -5.0e-03 1e-01 1e-08 \_4e\_02 0e+00 0e+00 -6e-02 0e+00 -1.5e-02 2003 2003 2003 2002 2003 2003 2001 2002 2001 2002 2004 2001 2002 2004 2001 2001 2002 dry deposition rate of BC – high–so4 wet deposition rate of BC – high–so4 upwelling clear-sky shortway clear-sky net radiative implied cloud response flux at TOA - high-so4 flux at TOA - high-so4 at TOA - high-so4 1.6e-01 1e+00 5e-01 rsutcs 1.2e-01 ∆ (rlut + rsut - rlutcs -2e-01 ∆ wetbc ∆ drybc 0e+00 1e-01 8.0e-02 8.0e-02 4.0e-02 -1e+00 -4e-01 2001 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year dry deposition rate of SO2 – high–so4 total deposition rate of BC – high–so4 wet deposition rate of SO4 – high–so4 dry deposition rate of SO4 – high–so4 wet deposition rate of SO2 - high-so4 -2e+00 2.0e+01 -3.6e+005e-01 4e+00drybc + wetbc ∆ dryso2 ∆ dryso₂ 3e+00 0e+00 2e+00 -4.4e+00-5e-01 -4e+00 1.0e+01 1e+00 2003 2002 2003 2003 2002 2003 2003 Year total deposition rate of S – high–so4 ambient aerosol optical total cloud cover convective cloud cover (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3thickness at 550nm - high-s percentage - high-so4 percentage - high-so4 2e-01 0e+00 3e+00 2e+00 ∆ clt -4e+01 0e+00 1e+00 0e+00 -6e+01 0e+00 2002 2003 2002 2003 2003 Year Year Year Year CESM1 GISS MIROC **GFDI UKESM** E3SM NorESM2 OsloCTM3 **GEOS**