## Reference – absolute global averages surface flux of BC - global surface flux of SO2 - globa surface concentration surface concentration of SO4 – global surface concentration of SO2 – global 1.4e-09 1.2e-10 5.2e-13 emibc (kg m-2 s-1) emiso2 (kg m-2 s-1) 1.25e-09 kg-1) nmrbc (kg kg-1) so2 (kg kg-1) 1.1e-10 1.0e-1 mmrso4 (kg 1.00e-09 9.0e-12 9.0e 4.8e-13 8.0e-1 2002 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2003 2001 2002 2003 Year Year Year Year Year upwelling longwave flux at TOA – global upwelling shortwave flux at TOA – global upwelling clear-sky longwave flux at TOA – global net radiative flux at TOA - globa incident shortwave flux at TOA – global 244 108 264 350 340.50 rlut + rsut (W m-2) 242 340.45 rlutcs (W m-2) rlut (W m-2) rsut (W m-2) (W m\_ 262 104 340.40 261 sdt 102 340.35 238 340 260 340.30 100 236 2001 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 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 - global flux at TOA - global of BC – global of BC - global of BC - global 53 2.0e-13 drybc + wetbc (kg m-2 s-1 5.4e-13 rlutcs + rsutcs (W m-2) 52 314 drybc (kg m-2 s-1) rsutcs (W m-2) 5.2e-13 wetbc (kg m-2 51 4.0e-13 312 50 5.0e-49 310 48 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 2001 2002 2003 Year Year Year Year Year (kg m-2 s-1)dry deposition rate of SO2 – global dry deposition rate of SO4 – global wet deposition rate of SO4 – global wet deposition rate total deposition rate of SO2 – global of S – global 7e-12 wetso4)/3 dryso2 (kg m-2 s-1) dryso4 (kg m-2 s-1) 1.25e-1 wetso2 (kg m-2 s-1) (kg m-2 s-1)6e-12 6.5e-12 2e-12 + (dryso4 5e-12 wetso4 5.5e-12 7.50e-12 (dryso2 + wetso2)/2 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 2001 2002 2003 2004 Year Year ambient aerosol optical total cloud cover convective cloud cover thickness at 550nm - global percentage - global percentage - global 0.16 65.0 0.12 od550aer % clt (%) 62.5 cltc 0.08 2 60.0 0.04 0 2002 2003 2003 2001 2002 2003 2004 2001 2004 2001 2002 2004 Year Year Year OsloCTM3 CESM1 **GFDI** MIROC E3SM **GISS** NorESM2