## Reference – absolute global averages surface concentration of SO2 – global surface flux of BC - global surface flux of SO2 - globa surface concentration surface concentration of SO4 – global 1.4e-09 1.50e-09 5.2e-13 1.2e-10 emibc (kg m-2 s-1) emiso2 (kg m-2 s-1) kg-1) nmrbc (kg kg-1) 1.25e-09 so2 (kg kg-1) 1.0e-1 mmrso4 (kg 1.00e-09 1.0e-10 9.0e-12 7.50e-10 4.8e-13 8 0e-1 2002 2002 2003 2001 2002 2003 2004 2001 2002 2003 2001 2002 2003 2001 2003 2001 Year Year Year Year Year upwelling longwave flux at TOA – global incident shortwave flux at TOA – global upwelling clear-sky longwave flux at TOA – global upwelling shortwave flux net radiative flux at TOA - globa at TOA - global 244 340.6 268 350 rlut + rsut (W m-2) 105 242 266 rlutes (W m-2) rlut (W m-2) rsut (W m-2) sdt (W m-2) 264 262 238 95 260 335 2001 2003 2001 2002 2003 2004 2001 2003 2001 2003 2001 2003 Year Year Year Year Year upwelling clear-sky shortwave clear-sky net radiative dry deposition rate wet deposition rate total deposition rate of BC – global flux at TOA - global flux at TOA - global of BC - global of BC - global 324 2.0e-13 drybc + wetbc (kg m-2 s-1) rlutcs + rsutcs (W m-2) 5.0e 320 drybc (kg m-2 s-1) wetbc (kg m-2 s-1) rsutcs (W m-2) 52 316 50 312 3.5e-13 3.0e-13 48 308 2003 2003 2003 2003 2001 2002 2003 2001 2002 2001 2002 2001 2002 Year Year Year Year Year (dryso2 + wetso2)/2 + (dryso4 + wetso4)/3 (kg m-2 s-1) wet deposition rate of SO4 – global total deposition rate of S – global dry deposition rate of SO2 – global dry deposition rate of SO4 – global wet deposition rate of SO2 – global 7e-12 dryso2 (kg m-2 s-1) wetso2 (kg m-2 s-1) dryso4 (kg m-2 s-1) wetso4 (kg m-2 s-1) 6e-12 2e-12 5e-12 3e-12 9.0e-13 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 convective cloud cover total cloud cover thickness at 550nm - global percentage - global percentage - global 0.16 65 30 od550aer cltc (%) clt (%) 20 0.12 60 10 0.10 0 2003 2002 2003 2004 2002 2003 2004 2002 2004 2001 2001 2001 Year Year Year OsloCTM3 CFSM1 F3SM **GFDI** MIROC CESM2 **GEOS GISS** NorESM2 **UKESM**