bc-no-season: percent difference surface flux surface flux surface concentration surface concentration surface concentration of BC - SH-sea of SO2 - SH-sea of BC - SH-sea of SO4 - SH-sea of SO2 - SH-sea 0.0e + 002e-01 2e-02 0e+00 1.5e+00 -2.5e+01 1e-02 ∆ emibc 0e+00 mm -5.0e+01 5.0e-01 -2e-01-1e+01 -7.5e+01 -1e-02 0.0e+0.02000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year upwelling longwave flux at TOA – SH–sea upwelling shortwave flux at TOA – SH-sea upwelling clear-sky longwav flux at TOA - SH-sea net radiative flux incident shortwave flux at TOA - SH-sea at TOA - SH-sea 7.5e-02 2e-02 2e-01 5.0e-02 rsut 2e-08 1e-02 rsdt rsut ∆ rlut + ı 2.5e-02 0.0e+00 0e+00 00 ± 00 -2 5e-02 2000 2001 2002 2003 2004 2002 2003 2004 2002 2003 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2000 2000 2001 Year Year Year Year Year upwelling clear–sky shortwa flux at TOA – SH–sea wet deposition rate of BC – SH–sea clear-sky net radiative implied cloud response dry deposition rate flux at TOA - SH-sea at TOA - SH-sea of BC - SH-sea rsutcs) 1.5e-0° 3e-01 1.0e-01 1e-01 rsutce rlutcs -2e-01 -5.0e+00 5.0e-02 5e-02 1e-01 rsut – 0.0e + 0.00e+00 0e+00 -1.5e+01 -5 0e-02 -1e-01 -5e-02 -2.0e+0.12000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2000 2001 2002 2003 2004 Year Year total deposition rate of BC – SH–sea dry deposition rate of SO4 – SH–sea dry deposition rate of SO2 – SH–sea wet deposition rate of SO4 – SH-sea wet deposition rate of SO2 - SH-sea 1e+00 5.0e-01 ∆ drybc + wetbc 1e+00 56-01 ∆ dryso2 ∆ wetso2 ∆ wetso4 ∆ dryso4 -1e+015e 0e+00 0.0e+005e-01 -2e+01 -01 0e+00 0e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year $\frac{1}{3} dryso2 + wetso2)/2 + \frac{1}{3} dryso4 + wetso4)/3$ Year total deposition rate ambient aerosol optical total cloud cover - SH-sea convective cloud cover - SH-s surface cloud cover - SH-se of S - SH-sea thickness at 550nm - SH-se 3e+00 1e-01 2e-01 -2e+01 ∆ od550ae ا کا کا -1e-01 0e+0000+00 1e+00 0e+00 -6e+01 -2e-01 -1e-01 -2e-01 -1e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 20002001200220032004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year ice water path - SH-sea column mass burden column mass burden column mass burden surface concentration of BC - SH-sea of DMS - SH-sea of SO2 - SH-sea of SO4 - SH-sea 3e-01 5e-01 2e+00oadso2 0e+00 1e+00 0e+00 -2e+01 -5e-01 -1e-015.0e+00 0e+00 -3e+01 -2e-01 0.0e+00 -1e+00 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 2000 2001 2002 2003 2004 Year Year Year Year Year CAM5 E3SM **GISS** OsloCTM3 CESM1 **GEOS** MIROC **UKESM** CESM2 GFDL NorESM2