

New radiative forcing experiment in AeroCom Phase II

With some radiative forcing results from Oslo CTM2

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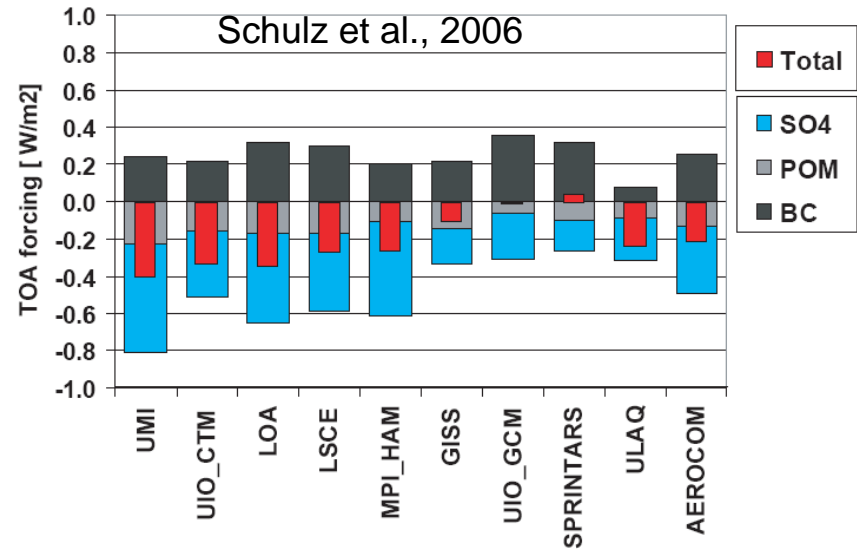
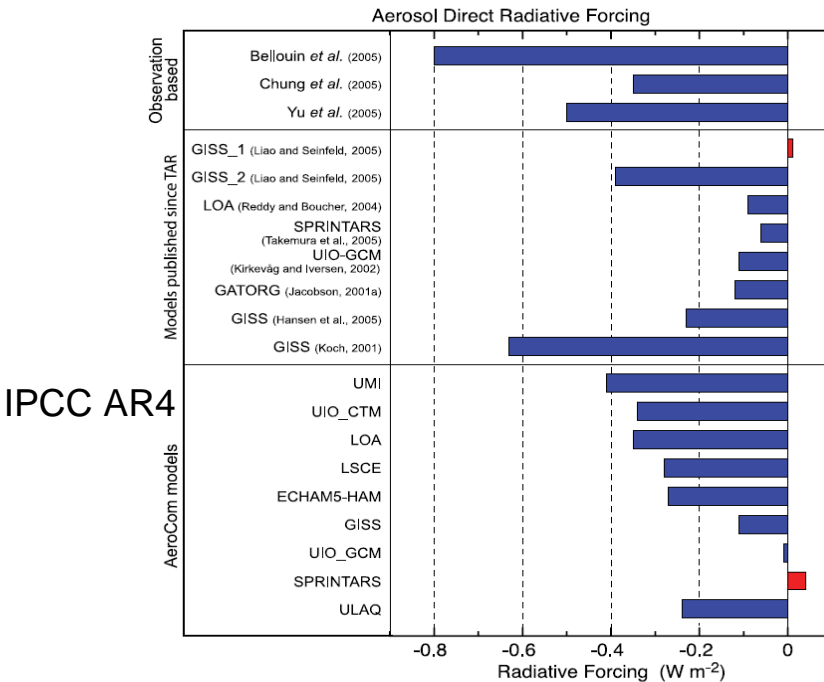


AeroCom 7th workshop



Phase II radiative forcing experiment

- The AeroCom Phase I radiative forcing experiment was important for the IPCC AR4 estimate of the radiative forcing of the direct aerosol effect



- The global aerosol models have developed with respect to spatial resolution, aerosol microphysics, and aerosol components
- More aerosol observations to validate the global aerosol models with



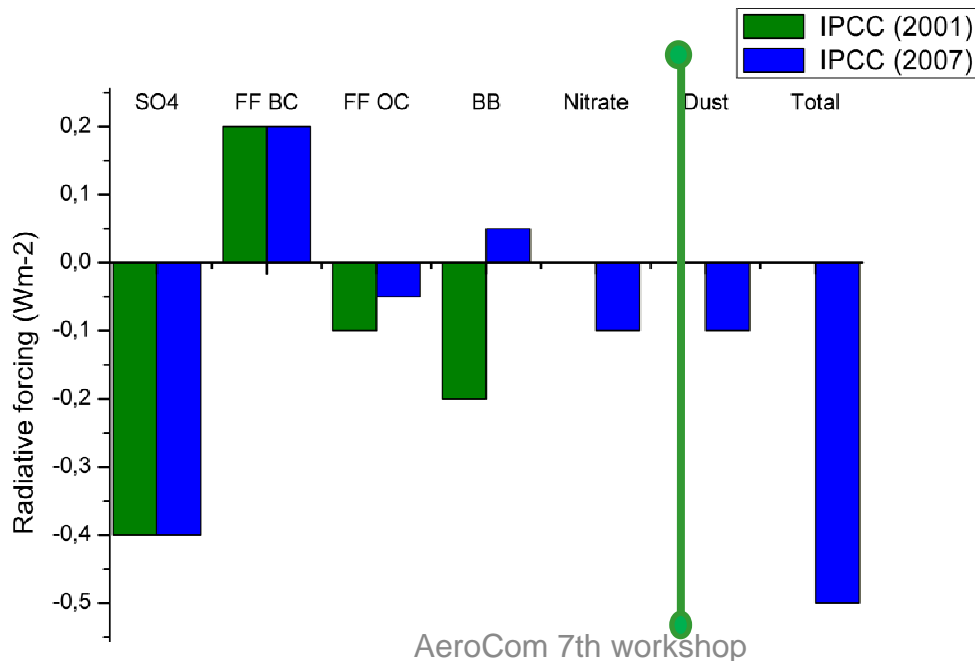
Phase II radiative forcing experiment

- Start in January 2009 with deadline for results about one year from now
- A paper ready for the IPCC AR5 process
- Two set of radiative transfer calculations must be performed, one for present and one for pre-industrial condition
- Emission data to be decided before January, but hopefully IPCC data for 2008
- Meteorological data for year 2008, to be decided before January

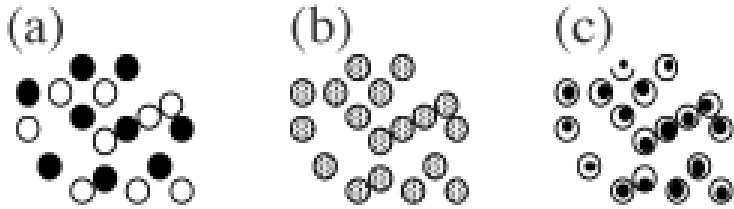


Phase II radiative forcing experiment

- RF results will be calculated for the following aerosol components:
 - RF from Sulphate, FF BC, FF OC, SOA, Biomass burning aerosols, Nitrate, Dust?
 - Total direct aerosol effect RF



Internal and external mixing of BC



- a) External mixture
- b) Internal mixture, homogeneous
- c) Internal mixture, coated sphere

Cheng et al., 2006; Hara et al., 2003; Mallet et al., 2004; Wentzel et al., 2003 and others show that BC particles are in a combination of internal and external mixture

Bond et al. (2006) suggest that hydrophilic BC absorption is enhanced by 50% compared to external mixture

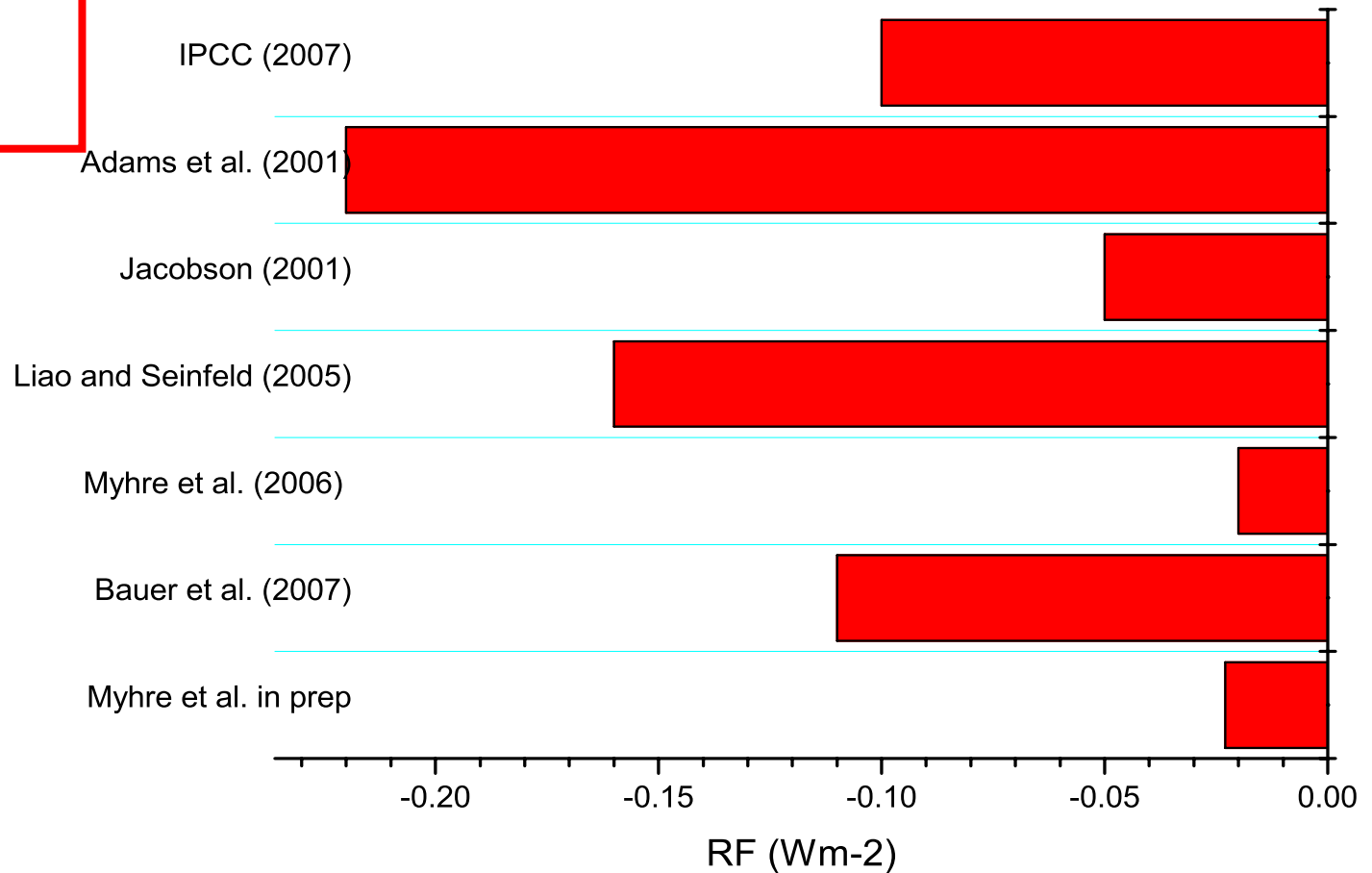
RF of direct aerosol effect of BC in the Oslo CTM2 (Myhre et al., ACPD, 2008)

External mixture (case a)	0.26 W m^{-2}
Coated sphere (case a and c)	0.33 W m^{-2}

Scattering aerosols enhance the RF of BC

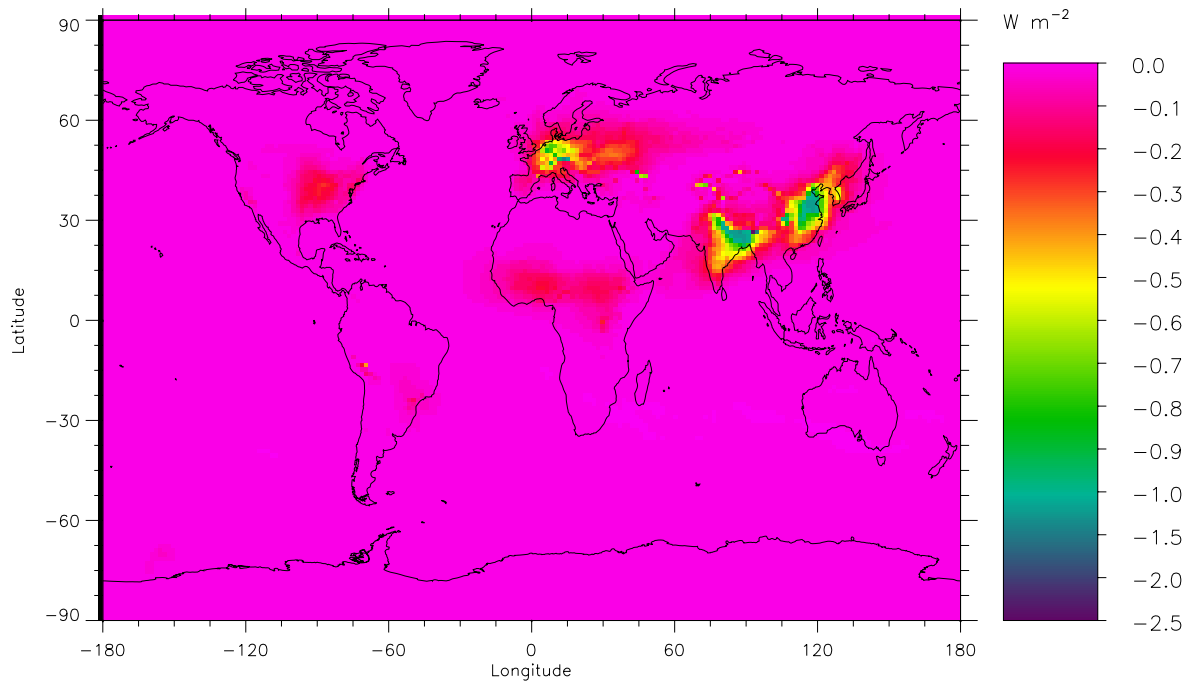
RF estimates for nitrate

Larger range than for most other aerosol components



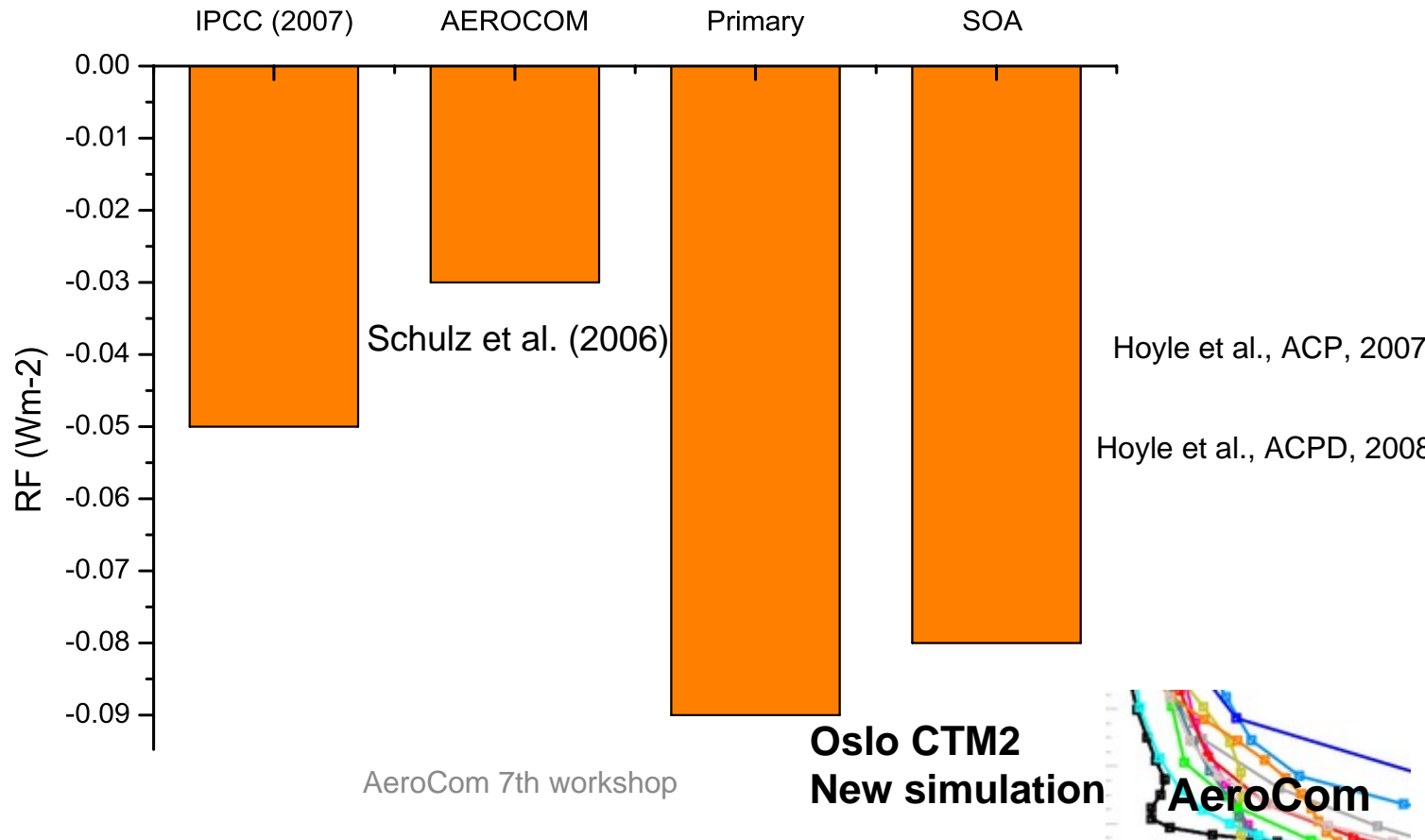
The nitrate amount is dependent on other aerosol species and aerosol precursors

- NH_3 and NO_x
- Sulphate, since the excess of NH_3 can react to NH_4NO_3
- Large particles as sea salt and mineral dust

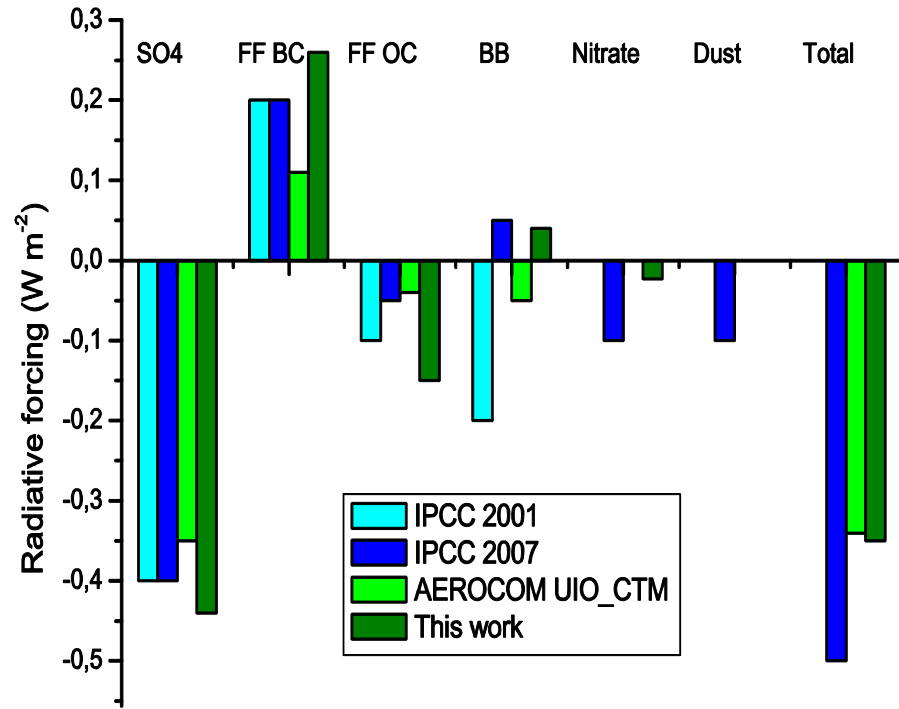
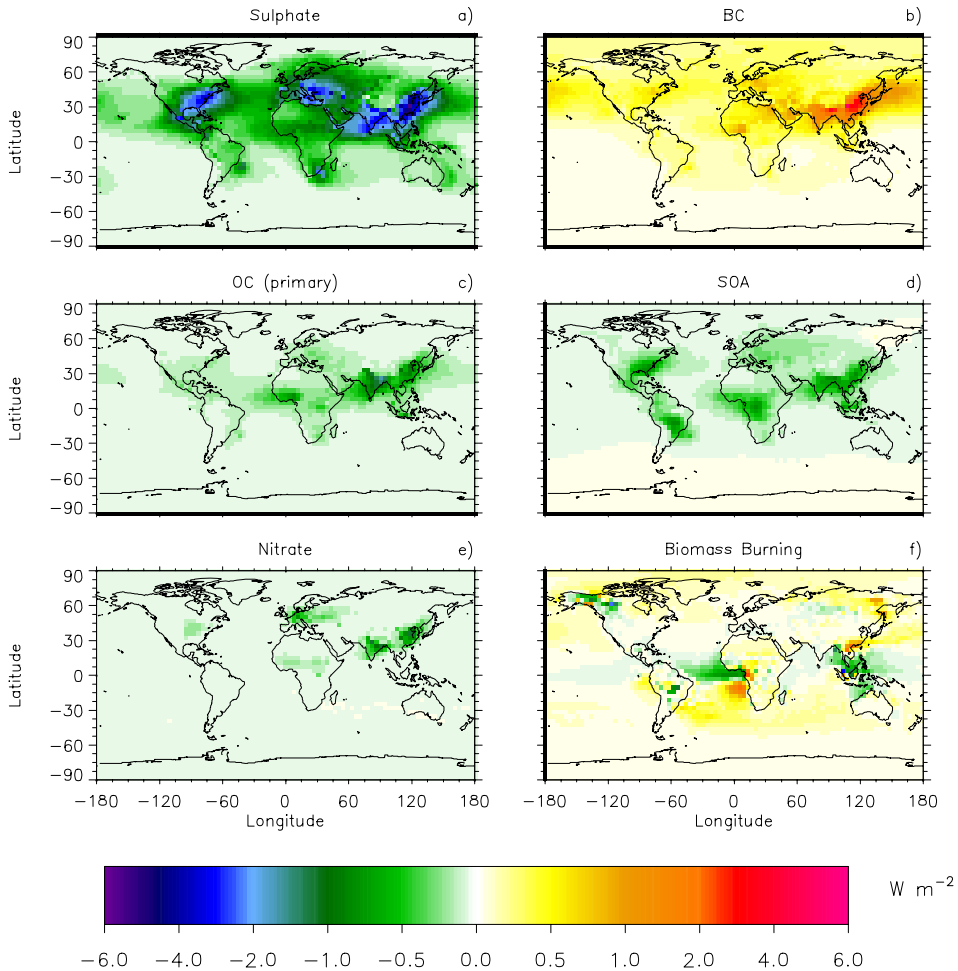


RF OC Fossil fuel and SOA

- ✓ Secondary organic aerosols (SOA) were simplified treated in Schulz et al. (2006) and only included as a natural component
- ✓ SOA is also important for the biomass burning aerosols
- ✓ Monthly SOA production fields may be available from the Oslo CTM2 model soon
- ✓ For primary organics look at the OM/OC ratio



RF estimates from Oslo CTM2



Myhre et al., ACPD, 2008

Three Open Post. Doc. positions available in Oslo. If you have good candidates please contact:

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