Minutes Act. 3, presentation Annual Quantify Meeting 20 feb 1008

by Richard Bintanja

Presenter: P. van Velthoven

1) Model evaluation, current impact, process studies, future impact

2) Multi-model evaluation; all models diverge from data, Oslo model outlier (perhaps due to use of POET emissions); NO good correlation.

   Q: are these total CO emissions?
   A: yes, figure represents background + transport CO

3) Current impact: 6 models participating (MOCAGE is new), 2 papers in pipeline; all exhibit similar O3 perturbations.

4) WP3.2.1. Impact of precipitation; wet/dry deposition NOy, , totals.

5) WP3.2.1. Geographical distribution, wet deposition more dispersed than dry deposition (especially for surface emissions).

   Q: what year?
   A: 2003.

   Q: maximum for ships is off?
   A: due perhaps to resolution, also note that plots are not on the same scale.

6) Removal of road traffic emissions; wet/dry 3 models; differences largely due to cloud/precip parameterization.

7) Removal of air traffic emissions; more dispersed, some differences among models,

8) Precipitation conclusions; wet deposition is more spread; models are overall similar.

9) WP3.2.3. Impact of cirrus on chemistry, new parameterization, impact on aircraft emissions.

10) WP 3.3.1/3.3.3. Future impact/mitigation.

11) Impact of future climate change for selected runs (focus on roads) for 2050, various scenarios.

Q: Non-CO2 emissions are small for road, still focus on road?
A: We will reconsider this, rather use a total transport perturbation.

Q: ClONO2 impact in cirrus clouds on tropospheric ozone (aircraft)?
A: This is uncertain.

Presenter: O. Dessens

1) 20 x 5% reduction or 100% reduction? Linearity of the response.

2) 5, 10, 20% reduction in aircraft emissions: linear for O3 and NH4 on various levels.

3) 5% reduction in Nox aircraft: Change in O3 = 4ppb (max).

4) Aircraft + Road + Ships versus All for 5%: very small differences (< 1%)

5) Aircraft + Road + Ships versus All for 100%: overall agreement, but some differences for instance in O3.

6) Max difference in O3 = 8% in NH lower troposphere: nonlinear effects.

7) 20 x 5% reduction or 100% reduction (for aircraft)? Changes in O3 are considerable, ranging from -15% (air corridor) to + 16% (lower troposphere).

8) Difference in ozone RF: 20 x 5% is larger than 100% by 5 mW/m2.

   Q: How are RF's calculated?
   A: Simple radiation model, annual mean state.

9) Methane impact (years lifetime): 20 x 5% larger than 100% by 0.1 to 0.3.

10) Conclusion: with 100% perturbation additive behavior is lost (errors > 5%) for changes in O3.

11) WP3.2.2. Sulphur emission impact on O3 (UTLS) for aircraft; sensitivity for background state.

12) Use model SLIMCAT (stratosphere studies).

13) AERO2K NOx emissions total 2.24 TgN/yr **(??? RB)** as NO2.

14) SO2/H2O emissions 176 TgS/yr.

15) Pinatubo background perturbation, change sulfur background, impact on O3.

16) Nox change 5 – 6%, O3 change 4 – 5%, due to aircraft.

17) Future work: decade run (stratosphere), background larger perturbation, other models.

    Q: So we should not use 5%?
    A: Fine to use 5%, just not say it is the total aircraft effect.

    Q: Is nonlinearity investigated in other studies.
    A: Yes, is identical in some other models.

    Q: Large spread among models?
    A: Possible, yes.

    Q: How does addition of effects work with combination of plus and minus effects?
    A: Uncertain.

Presenter: M. Gauss

1) Planning future runs / mitigation.

2) Emissions status (current/future): all on Act. 1 webpage as text/netcdf files.

3) Should do model simulations for current and 2050, with 5% sensitivity runs.

4) Select aircraft scenario, 9 possible cases, need to choose.

5) Mitigation for aircraft 2050: use ACARE scenario for mitigation?

6) Sensitivity study for road 2050: ozone precursors near zero in 2050, focus on CO2.

7) Mitigation for ships 2050: being discussed, efficiency increase in engines enhance NOx emissions.

    Q: Should we also look at mitigation failure scenario for shipping?
    A: Yes.