

<b>Title :</b>	Session 5a: Common resistance modelling land-atmosphere framework	
<b>Time :</b>	Tues 25/10/11, 16:00-18:00	
<b>Chair :</b>	Eiko Nemitz	NERC/CEH
<b>Attendees :</b>	28 partners mainly from C1; some also representing C2 (full list available from Eiko Nemitz)	
<b>Minutes by :</b>	Chris Flechard	INRA-Rennes

**Aim** To present existing models and approaches dealing with surface-atmosphere exchange of O<sub>3</sub> and reactive nitrogen; to start exploring strategies for improving models and implementation into CTMs, based on a common harmonised framework.

**Presentations by:**

- Juha-Pekka Tuovinen, FMI - the EMEP-DO3SE model; focus on non-stomatal parameterisations (dependence on radiation, temperature, relative humidity, soil moisture, LAI, column chemistry) and multi-layering
- Lisa Emberson, UoY - New developments in the DO3SE model; address impact of changing CO<sub>2</sub> on ecosystem O<sub>3</sub> dose; focus on improving stomatal parameterisations using photosynthesis based G<sub>s</sub> model; multi-layer model in preparation/testing for grassland. Which links with existing carbon-oriented ecosystem models (e.g. JULES; LPJ-guess)? Linkages with WP12, 13, 18.
- Benjamin Loubet, INRA - the SURFATM model for NH<sub>3</sub> and O<sub>3</sub> exchange, with treatment of heat and water transfer within soil-vegetation-atmosphere continuum, including compensation points for NH<sub>3</sub> and improved parameterisation of O<sub>3</sub> uptake at soil surface; the VOLTAIR model for NH<sub>3</sub> emissions by applied manures; the CERES-EGC model for carbon cycling in crops and treatment of nitrification/denitrification and NO/N<sub>2</sub>O emissions
- Laurens Ganzeveld, WU (given by Eiko Nemitz) - the Single Column Model (SCM), dealing with within- and above-canopy photochemistry and aerosol chemistry, application in global transport models, investigation of effects of land use and land cover changes on biogenic emissions; not clear how much aerosol chemistry & compensation points are currently implemented
- Eiko Nemitz, NERC - model of within and near-canopy heterogeneous chemistry of NH<sub>3</sub>-HNO<sub>3</sub>-NH<sub>4</sub>NO<sub>3</sub> triad, and effect on net N<sub>r</sub> exchange fluxes

**Topics discussed with Issue, decisions/conclusions and actions**

Issues: What level of model complexity is required / acceptable, in particular 2-layer canopy model vs multi-layer model? What degree of complexity can be validated with measurements?

Parameterisation of in-canopy turbulence: can measurements from C1 flux sites provide detailed data to be used for parameterisations?

Can flux measurements actually validate chemical interactions within canopies and differential pollutant deposition to different layers in canopy?  
Can O<sub>3</sub> fluxes be measured at several heights to quantify flux divergence?

Can chambers be used on forest floor or soil surface below crops to parameterise soil resistance for O<sub>3</sub>?

Decision: Sensitivity study to test 2-layer vs multi-layer model for heterogenous chemistry.  
Targeted measurements should be performed at C1 sites to address modellers' needs, where and if possible.  
Need to coordinate efforts with WP1, 2, 7,12. Also important to aim for common solution (with WP8) to sub-grid issues.

### Decisions

Action	Due	Who
Sensitivity study of 2-layer vs multi-layer run with heterogenous chemistry	Before meeting (next item)	Eiko Nemitz / NERC
Small, targeted meeting to take place within 3 months	End of 2011/early 2012	WP4 modellers + key C1 site PIs
Wish list from modellers to be provided to C1 flux site PIs	After above meeting	
ECLAIRE project to be represented at Paris workshop (organised by INRA) on surface-atmosphere exchange, September 2012	25-27 September 2012	