

PEEX – MP: Modelling Platform Working Group Meeting & Discussions



PAN EURASIAN EXPERIMENT (PEEX)

– TOWARDS A NEW MULTINATIONAL, MULTIDISCIPLINE
CLIMATE, AIR QUALITY AND ENVIRONMENT
RESEARCH EFFORT IN ARCTIC AND BOREAL
PAN-EURASIA REGIONS

Rapporteurs:

***Alexander Baklanov & Alexander Mahura
on behalf of the PEEX-MP session participants***

1st Pan-Eurasian EXperiment (PEEX) Science Conference & 5th PEEX Meeting
Helsinki, Finland , 9-13 Feb 2015

Session / WG Meeting: PEEEX-MP (12 Feb 2015)

Short Orals - 11

- 1. PEEEX-MP: Including New Tools/Models for Earth System Observations and Forecasting** (*Alexander Mahura, DMI, Denmark & Alexander Baklanov, WMO, Switzerland & PEEEX-MP team*)
- 2. Boundary layer issues in NWP and climate models** (*Anton Beljaars, ECMWF, UK*)
- 3. Ecological modeling in the PEEEX domain: recent results and needs** (*Anatoly Shvidenko, IIASA, Austria*)
- 4. Estimates of CH₄ emissions from natural wetlands in China: From 1950 to 2008** (*Tingting Li et al., IAP-CAS, China*)
- 5. Process based modelling of particle formation in the planetary boundary layer** (*Zhou Luxi, UHel, Finland*)
- 6. Current status of modelling activities of BVOC emissions and atmospheric reactivity in the boreal forest** (*Ditte Mogensen, UHel, Finland*)
- 7. A study of aerosol dynamics in the cloud area with direct numerical simulations** (*Natalia Babkovskaia, UHel, Finland*)
- 8. Micro-climate assessment with LES and statistical tools – delivering climate information to end-users** (*Igor Ezau, NERSC, Norway*)
- 9. Some aspects of linking vegetation processes and atmosphere** (*Steffen Noe, IAES-EULS, Estonia*)
- 10. Variational framework for inverse modeling of atmospheric dynamics and chemistry** (*Alexey Penenko, ICM&MG SB RAS, Russia*)
- 11. Sea-Ocean Modelling with SWAN** (*Stanisav Myslenko, Moscow State University, Russia*)

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Mini-Posters - 2

- **Atmosphere modeling capability in CNR-ISAC** (*Oxana Drofa, F. Tampieri, P. Malguzzi, M. Fantini, S. Davolio, D. Mastrangelo, A. Buzzi; CNR-ISAC, Italy*)
- **Towards next generation regional earth system models** (*Jun She, Tian Tian, Kristine S. Madsen, Jacob W. Poulsen, Per Berg, Lars Jonasson, Ruth Mottam; DMI, Denmark*)

Followed by Discussions

- **attended - about 30 participants,**
- **presented 11 short-orals & 2 mini-posters**
- **by the end - participated in discussions - about 20 persons**

PEEX-MP Purposes & Aims

- **For the purpose** of supporting the PEEX observational system and answering on the PEEX scientific questions, a **hierarchy/ framework of modern multi-scale models for different elements of the Earth System** integrated with the observation system is needed
- **The PEEX-MP aims** to simulate and predict the physical aspects of the Earth system and to improve understanding of the bio-geochemical cycles in the PEEX domain, and beyond.

Members of the PEEEX – MP Modelling Platform

Joint e-mail list: peex-modelling@helsinki.fi

almost 50 members from European, Russian, and Chinese institutions including international organizations (ECMWF, WMO) covering different multi-scales and types of models
&

New persons will be added

(based on interest shown at the PEEEX-MP session, 12 Feb)

Core Group

Stephen Arnold, Igor Ezau, Francesco Tampieri, Wen Zhang, Harri Kokkola, Tuula Aalto, Steffen M. Noe, Anatoly Shvidenko, Alexander Baklanov, Alexander Mahura, +...

For new members

OR whom still did not contribute

please, send:

- e-mails of persons to be involved in PEEEX-MP
- other relevant existing projects to link with PEEEX
- info on each model planned to be used (0.5p text – general model description, up to 3 refs, 1 figure – the most illustrative)
- your possible contribution with your modelling tools(s) to PEEEX (0.25 page)
- “wish list” from modelers to PEEEX-Obs Group; what is needed for validation
- continue building the core group (volunteers are still welcome)

send to ama@dmi.dk, abaklanov@wmo.int

Key issues for modelling in PEEEX

- Anthropogenic emissions
- Permafrost effects
- CO₂ and methane
- Ecosystem carbon cycle
- Short lived pollutants and climate forcers
- BVOC emissions
- Forest fires and their effects
- Aerosol formation in Arctic and Siberia
- Aerosol radiative forcing
- Air pollution – ecosystem feedbacks

12 Feb 2015:

Planned Topics to Discuss

- **New members/ teams**
- **Adding models/ research tools**
- **Current focuses and research tasks**
- **On-going projects & funding opportunities**
- **Link to international/national programmes**
- **Collaboration with other PEEX WGs (*especially, on measurements – satellite & ground-based*)**
- **???**

Discussed Topics (12 Feb 2015)

- **Modelling platform implementation (now we have about 30 models – shown on next slides)**
- **Stronger link between MP and PPEX-Observations**
- **Possible funding: HORIZON-2020, NordForsk, RFFI (RU), EU+China (MarcoPolo, PANDA), COST Actions (STSMs)**
- **Learn from each other experiences**
- **Interdisciplinary approach – Earth System**
- **Divide into subgroups by scale & model types**
- **Make summary table with models info**
- **Young scientists: summer schools, e.g. Panda-MarcoPolo, (Germany, Aug 2015)**
- **At which scale we would like to link processes ?**
- **How to handle heterogeneous surface boundary conditions?**

MODELS AVAILABLE & TO BE USED BY PARTNERS - 1:

1. **HadGEM2-ES** - Hadley Centre Global Environment Model Ver. 2 – incl. detailed extended atmospheric chemistry UKCA-ExtTC model
2. **Enviro-HIRLAM/HARMONIE** - online integrated meteorology-chemistry multi-scale modeling system
3. **SILAM** - System for Integrated modelLling of Atmospheric coMposition; troposphere and stratosphere multi-scale chemical transport model
4. **ECMWF/MACC** atmospheric composition analyses and forecasts
5. **FLEXPART** - Lagrangian type model, applications to inverse modeling of GHG emissions
6. **DERMA & CAMx** models
7. **SOSAA** – model to Simulate Organic compound, Sulfuric Acid and Aerosols
8. **HYCOM-CICE** – Coupled Ocean & Sea Ice System
9. **RuBCliM & EFIMOD** – empirical and semi-empirical models of forest dynamics
10. **CH4MOD** - model for estimation of CH₄ emissions from wetlands
11. **SWAN** - Simulating WAves Nearshore
12. **Agro-C** - model for simulation carbon cycling in agroecosystems
13. **LandscapeDNDC** - process model for simulation of biosphere–atmosphere–hydrosphere exchange processes at site and regional scale.
14. **GLOBO/BOLAM/MOLOCH** - model suite for meteorology from global to local scales
15. **BOLCHEM** - atmospheric composition modeling at regional scale
16. **FLEXPART+BOLAM** - forward and backwards trajectories at regional scale

MODELS AVAILABLE & TO BE USED BY PARTNERS - 2:

17. **IL-GLOBO** - integrated Lagrangian particle model at global scale
18. **MILORD** - long range Lagrangian particle dispersion model
19. **AVIM2** - Atmosphere-Vegetation Interaction Model ver2
20. **NEMO-LIM3** - ocean-sea-ice model coupled through OASIS.
21. **EC-EARTH** - earth system model with component models: IFS - atmosphere, NEMO - ocean, and LIM - sea-ice, coupled through OASIS.
22. **UCLALES-SALSA** - Large Eddy Simulation model with aerosol module SALSA, can be used to study aerosol-cloud interactions in a cloud resolving scale
23. **CTDAS** - CarbonTracker atmospheric inverse model
24. **SIM-BIM** - model to estimate BVOC emission fluxes from vegetation
25. **PENCIL-CLOUD** (DNS) and **ASAM** (LES) models
26. **TOMCAT-GLOMAP** - off-line 3D global model of tropospheric chemistry-aerosol and transport
27. **CAM-Chem** - Community Atmosphere Model with online tropospheric gas-phase and aerosol chemistry
28. **JULES** - Joint UK Land Environment Simulator, to assess ecosystem response to surface climatology at the large scale
29. **MPI-ESM** - coupling atmosphere, ocean and land surface through the exchange of energy, momentum, water and important trace gases such as carbon dioxide