

# Seventh International SRNWP-Workshop on Non-Hydrostatic Modelling

Bad Orb, 5 - 7 November 2007

Deutscher Wetterdienst

Monday, 05/11/2007

09:00 - 09:35

## Opening

- W. Kusch** DWD, Offenbach, Germany  
Opening by President of DWD
- G. Adrian** DWD, Offenbach, Germany  
Opening by Vize President of DWD, Head of the GB FE
- J. Quiby** EUMETNET, SRNWP Programme Manager, Zürich, Switzerland  
Address of SRNWP Representative
- W. Stork** Bad Orb  
Address of Mayor of Bad Orb
- M. Baldauf** DWD, Offenbach, Germany  
Lead Centre for Non-Hydrostatic Modelling

## Numerical Developments

Chairperson: **M. Baldauf**

- 09:35 - 09:55 **N. Wood, M. Diamantakis, A. Staniforth, Met Office, Exeter, UK**  
A Monotonically Damping, Second-Order Accurate, Unconditionally Stable, Numerical Scheme for Diffusion
- 09:55 - 10:15 **M. Diamantakis, T. Davies, N. Wood, Met Office, Exeter, UK**  
Iterative Time-Stepping for the Met Office's Semi-Implicit Semi-Lagrangian Non-Hydrostatic Model
- 10:15 - 10:35 **M. Tolstykh, R. Fadeev, Russian Academy of Sciences, Moscow, Russia**  
Development of the Non-Hydrostatic Version of the Global SL-AV-Model
- 10:35 - 10:55 **W. Skamarock, NCAR, Boulder, CO, USA**  
Grid Anisotropy in High-Resolution Global Nonhydrostatic Models

10:55 - 11:15 **Coffee and Poster**

Chairperson: **T. Davies**

- 11:15 - 11:35 **G. H. Bryan, NCAR, CO, USA**  
Conservation of Total Energy and Total Momentum in Nonhydrostatic Numerical Models
- 11:35 - 11:55 **A. Gassmann, M. Giorgetta, P. Korn, H. Wan, MPI, Hamburg; J. Förstner, Th. Heinze, H.-J. Herzog, D. Majewski, M.-P. Ripodas, DWD, Germany**  
ICON – the Next Generation General Circulation Model for NWP and Climate Research in Germany

- 11:55 - 12:15 **J. Steppeler, Bad Orb, Germany**  
Third Order Schemes with Conservation
- 12:15 - 12:35 **M. Baldauf, DWD, Offenbach, Germany**  
Stability Analysis of the Runge-Kutta Time Integration Schemes for the Convection Resolving Model COSMO-DE (LMK)

**12:35 - 14:00 Lunch**

- 14:00 - 14:20 **S. Lock, A. Coals, A. Gadian, Univ. of Leeds, UK; H.- W. Bitzer, U. Schättler, DWD, J. Steppeler, Univ. of Bonn, Germany**  
Development of a Numerical Atmospheric Model for Studying Microscale Dynamics
- 14:20 - 14:40 **H. Yamazaki, T. Satumura, Division of Earth and Planetary Sciences, Univ. of Kyoto, Japan**  
Development of the Z-Coordinate High-Resolution Non-Hydrostatic Atmospheric Model Using the Shaved Cell Method
- Poster Poster **R. Petrik, A. Gassmann, MPI, Hamburg, M. Baldauf, DWD, Offenbach, Germany**  
Flux Diagnosis in the COSMO-DE Model for Testing Conservation Properties
- Poster Poster **J. Förstner, M. Baldauf, DWD, Offenbach, Germany**  
Advection of Moisture Quantities in the COSMO-Model
- Poster Poster **O. Knoth, IfT, Leipzig, Germany**  
The Moist Atmospheric Compressible Model ASAM (Modell + BraynFritsch Case)
- Poster Poster **St. Jebens, IfT, Leipzig, Germany**  
Peer-Methods for the Compressible-Euler-Equation

**Data Assimilation**

*Chairperson:* **C. Schraff**

- 14:40 - 15:00 **D. Leuenberger, MeteoSwiss, Zürich, Switzerland**  
Assimilation of Radar Rainfall and Use of Humidity Profiles from GPS Tomography in the Fine-Scale COSMO Model at MeteoSwiss
- 15:00 - 15:20 **M. Milan, C. Simmer, Univ. of Bonn, Germany**  
Physical Initialization for the Assimilation in Convective Systems
- 15:20 - 15:40 **Z. Sokol, IAP / ASCR, Prague, Czech Republic**  
Effect of Assimilation of Radar Reflectivity and Satellite Data on a Very-Short Range Forecast of Heavy Convective Rainfalls

- 15:40 16:00 **K. Stephan, C. Schraff, DWD, Offenbach, Germany**  
Assimilation of Radar Derived Rain Rates into the Convective Scale Model COSMO-DE at DWD
- Poster Poster **I. Zuurendonk, D. van Dijke, Meteo Consult BV, Wageningen, Netherland**  
Importance of a Good Model Initialisation, Demonstrated with WRF-ARW

16:00 - 16:30 **Coffee and Posters**

## Physical Parameterisation

*Chairperson:* **A. Seifert**

- 16:30 - 16:50 **C. Lac, T. Maric, J.-P. Pinty, S. Malardel, J. Pergaud, CNRM / GAME and CNRS/UPS, Toulouse, France**  
Recent Investigations of the Meso-NH Model for Meso-Scale Simulations
- 16:50 - 17:10 **W. Sha, Univ. of Tohoku, Japan**  
**Cancellation**  
A Comparison of LES Numerical Simulation with Wind Tunnel Experiment on Unstable Stratified Flow within and above a Modeled Urban City
- 17:10 - 17:30 **D. Reinert, V. Wirth, Univ. of Mainz, J. Schween, Univ. of Cologne, Germany**  
**Cancellation**  
The Origin of Banner Clouds: An Analysis Based on Large Eddy Simulations
- 17:30 - 17:50 **V. Küll, A. Bott, Univ. of Bonn, Germany**  
**Cancellation**  
HYMACS: A Hybrid and Nonlocal Mass Flux Convection Scheme for the COSMO Model
- 17:50 - 18:10 **K. Aranami, K. Takenouchi, T. Fujita, H. Kurahashi, H. Nakayama, Numerical Prediction Division, Tokyo, Japan**  
Development of High Resolution Local Forecast Model
- 18:10 - 18:30 **T. Schoenemeyer, Senior Solution Architect, NEC HPCE Duesseldorf, Germany**  
NEC's HPC Strategy

18:30 20:30 **Icebreaker**

## Tuesday, 6/11/2007

- 09:00 - 09:20 **J. A. Milbrandt, R. McTaggart-Cowan, Numerical Weather Prediction Research Section, Environment, Canada**  
Using Canadian Participation in MAP D-PHASE to Study the Impact of Multimoment Microphysics Parameterizations on QPF Guidance in Steep Terrain
- 09:20 - 09:40 **K. De Sanctis, R. Ferretti, F. Marzano, M. Montopoli, Univ. of L'Aquila; L. Molini, A. Parodi, F. Siccardi, CIMA-Univ., Italy**  
High-Resolution Numerical Forecast of a Hailstorm Event in the Po Valley: Sensitivity Analysis to Microphysical Parameterization Using COSMO-MODEL and MM5
- 09:40 - 10:00 **P. K. Wang, S. A. Hubbard, R. E. Schlesinger, Univ. of Wisconsin-Madison, Madison, WI, USA**  
**Cancellation**  
A Study of Hydrometeor Partitioning in Deep Convective Storms Using a Nonhydrostatic Cloud Resolving Model

Poster **L. Gerard, RMIB, Brussel, Belgium**  
Clouds and precipitation forecast with grid-box length between 9 and 2 km

## Precipitation Forecast and Cloud Resolving Modelling

*Chairperson:* **E. Richard**

10:00 - 10:20 **G. Zängl, Univ. of Munich, Germany**  
Does Increased Model Resolution Improve Simulated Precipitation Fields?  
A Case Study of Two North-Alpine Heavy-Rainfall Events

10:20 - 10:40 **J. B. Klemp, NCAR, Boulder, Colorado, USA**  
Progress in Convection-Resolving Forecasting with WRF

10:40 - 11:10 **Coffee and Posters**

11:10 - 11:30 **A. Morgillo, C.Marsigli, F. Grazzini, ARPA-SIM, Meteo-Hydrological Service of Emilia-Romagna, Bologna, Italy**  
Analysis of the Sensitivity of the Precipitation Forecast with Respect to Changes in the COSMO Model Parametrization

11:30 - 11:50 **J.Trentmann, H. Wernli, Univ. of Mainz; U. Corsmeier, P. Groenemeijer, J. Handwerker, M. Kohler, A. Wieser, IMK, Karlsruhe; A. Behrendt, M. Radlach, V. Wulfmeyer, Univ. of Hohenheim, Stuttgart, Germany**  
Cloud-Resolving Simulations of Convective Precipitation in Mountainous Terrain

11:50 - 12:10 **D. Rezacova, P. Zacharov, Z. Sokol, IAP ASCR, Prague, Czech Republic**  
The Scale Dependence of Uncertainty in the Quantitative Forecasting of Heavy Convective Rainfalls

12:10 - 12:30 **A. Seifert, M. Baldauf, DWD, Offenbach, Germany**  
Explicit Forecasting of Deep Convection with the Operational Convection-Resolving Model COSMO-DE

12:30 - 14:00 **Lunch**

*Chairperson:* **J. B. Klemp**

14:00 - 14:20 **H. Noppel, U. Blahak, K.D. Beheng, IMK, Karlsruhe; A. Seifert, DWD, Offenbach, Germany**  
COSMO-LM Simulations of a Strong Hail Storm with an Advanced 2-Moment Microphysical Scheme

14:20 - 14:40 **U. Blahak, IMK, Karlsruhe, Germany**  
Some Idealized Sensitivity Studies on Shallow-Convection-Triggered Storms with COSMO-LM

14:40 - 15:00 **Y. Ishikawa, T. Awaji, Y. Kiuchi, T. Satomura, Department of Geophysics, Kyoto University, Japan**  
Dependency of the Tropical Convective Clouds on the Sea Surface Temperature Simulated by a High-Resolution Coupled Model

15:00 - 15:20 **A. T. Noda<sup>1</sup>, M. Satoh<sup>1,2</sup>, H. Tomita<sup>1</sup>, T. Nasuno<sup>1</sup>, S. Iga<sup>1</sup>, H. Miura<sup>1</sup>, K. Oouchi<sup>1</sup>, Tokyo,1) Frontier Research Center for Global Change, Japan Agency for Marine-Earth Science and Technology; 2) Center for Climate System Research, The Univ. of Tokyo, Japan**

A Preliminary Study on Boundary-Layer Clouds in a Global 14 km-mesh Experiment by NICAM

15:20 - 15:40 **H. Volkert, IPA, DLR, Oberpfaffenhofen, Germany**  
Rain Amounts in Nature and Models: Observations from the COPS Field Phase in Summer 2007

15:40 - 16:00 **B. Brötz, J. Trentmann, H. Wernli, Univ. of Mainz, Germany**  
High-Resolution Model Simulation of Deep Convection in the Black Forest During COPS

#### 16:00 - 16:30 **Coffee and Posters**

16:30 - 16:50 **E. Richard, J.-P. Chaboureau, S. Argence and D. Gazen, CNRS/UPS, Toulouse, France**

Meso-NH Forecasts During COPS: Preliminary Results

Poster **G. Zängl, Univ. of München, Germany**  
Small-Scale Variability of Orographic Precipitation in the Alps: Case Studies and Idealized Simulations for the National Park Berchtesgaden Area

Poster **F. Ament, MeteoSchweiz, M. Koller, ETH Zürich, Switzerland**  
Towards Optimization of the COSMO-2 Model for Quantitative Precipitation Forecasts

Poster **M. Terada, T. Satomura, Division of Earth and Planetary Sciences, Kyoto University, Sakyo, Kyoto, Japan**  
Numerical Simulation of the Heavy Rainfall at the North Osaka Plain

Poster **S. Dierer et al., COSMO-Group, Univ. of Genova, NMA**  
An Assessment of Deficiencies and Sensitivities of Operational Quantitative Precipitation Forecasts Using the COSMO Model

Poster **S. Wassermann, M. Kunz, Ch. Kottmeier, IMK, Karlsruhe, Germany**  
Mechanisms of Precipitation Over Idealized Orography

Poster **J. W. Schipper, M. Kunz, Univ. of Karlsruhe, Germany**  
High-Resolution Simulations During Extreme Precipitation Events in the Upper Danube Catchment

Poster **L. Torrisi, UGM/CNMCA, Pomezia, Italy**  
Towards convective scale NWP: tuning of the 2.8 km COSMO-IT of the Italian Met. Service

#### **Verification and Ensemble Prediction**

*Chairperson:* **H. Volkert**

16:50 - 17:10 **F. Ament, MeteoSwiss, Zürich, Switzerland**  
Precipitation Forecasts in the Alps – an Assessment by the Forecast Demonstration Project MAP D-PHASE

- 17:10 - 17:30 **K. Saito, H. Seko, M. Kunii and M. Hara (Meteorological Research Institute/JMA); T. Hara and M. Yamaguchi (Numerical Prediction Division/JMA), Japan**  
Mesoscale Ensemble Prediction Trial for the WWRP Beijing 2008 Research and Development Project
- 17:30 - 17:50 **H. Seko\*, K. Saito\*, M. Kunii\*, T. Hara\*\*, M. Kyouda\*\* , M. Yamaguchi\*\*, \* Meteorological Research Institute, Tsukuba, Ibaraki 305-0052, Japan; \*\* Numerical Prediction Division, Japan Meteorological Agency**  
Japan Area Mesoscale Ensemble Experiments Using JMANHM
- 17:50 - 18:10 **N. van Lipzig, K. van Weverberg, T. Steegmans, Physical and Regional Geography Research Group; K. U. Leuven, Belgium; S. Crewell, Univ. of Cologne, Germany; L. Delobbe, Royal Meteorological Institute of Belgium; G. Haase, SMHI, Sweden**  
Evaluating the Representation of Clouds and Precipitation in Non-Hydrostatic Atmospheric Models for the Belgian Region
- 18:10 - 18:30 **Michael Riedmann - Senior Performance Consultant, Hewlett-Packard GmbH, Berlin, Germany**  
HP Solutions for Climate & Weather Research

20:00 **Dinner in the Basement of the Concert Hall**

### Wednesday, 7/11/2007

*Chairperson:* **F. Ament**

- 09:00 - 09:20 **M. Zimmer, M. Paulat, H. Wernli, Univ. of Mainz, T. Reinhardt, S. Crewell, Univ. of Cologne, Germany**  
First Results on the Verification of Precipitation Forecasts from COSMO Models During the GOP 2007
- 09:20 - 09:40 **K. Dengler, C. Keil, DLR, Oberpfaffenhofen, Germany**  
MM5/COSMO-DE Model Inter-Comparison and Model Validation
- 09:40 - 10:00 **L. Molini (2), A. Parodi (2) and F. Siccardi (2), K. De Sanctis (1), R. Ferretti (1), F. Marzano (1,3), M. Montopoli (1), (1) Dipartimento di Fisica/CETEMPS, Univ. of L'Aquila, ITALY, (2) CIMA-Univ. of Genoa, (3) DIE- Univ. La Sapienza, Rome, Italy**  
Characterization of Rainfall C-Band Radar Response and Dual-Polarized Measurement for an Hailstorm Event
- Poster **R. Ahmadov, C. Gerbig, K. Dhanya, R. Kretschmer, S. Koerner, MPI for Biogeochemistry, Germany; B. Neininger, MetAir, Switzerland**  
High-Resolution CO<sub>2</sub> Transport Simulations Using WRF-VPRM
- Poster **C. Gebhardt, T. Winterrath, S. Theis, V. Renner, DWD, Offenbach, Germany**  
The COSMO-DE Ensemble Prediction System – Strategies and First Results
- Poster **U. Damrath, DWD, Offenbach, Germany**  
Verification of precipitation forecasts of operational DWD-models against radar data

**10:00 - 11:30 Working Groups**

**Working Group1:**

**Conservation Properties of higher Order Discretisations?**

Chairperson: W. Skamarock

Protocol: M. Baldauf

**Working Group 2:**

**Quantitative Precipitation Forecast I: Parameterization issues**

Chairperson: J. Milbrandt

Protocol: A. Seifert

**Working Group 3:**

**Quantitative Precipitation Forecast II: Quality of Precipitation Forecast, Verification, and Interpretation issues**

Chairperson: H. Volkert

Protocol: J. Quiby

**11:30 - 12:00 Coffee and Posters**

12:00 - 12:15 **Report of the Chairperson of Working Group 1 and Discussion**

12:15 - 12:30 **Report of the Chairperson of Working Group 2 and Discussion**

12:30 - 12:45 **Report of the Chairperson of Working Group 3 and Discussion**

13:00 **End of Workshop**