Regional Cooperation for Limited Area Modeling in Central Europe



## LACE in 2016

#### Yong Wang + many LACE colleagues







## Organisational: No change

Programme Manager: Yong Wang

– Area Leaders:

Dynamics & Coupling: Petra Smolikova

Physics: Neva Pristov

Data Assimilation: Mate Mile

Predictability: Martin Bellus

- Data Manager: Alena Trojakova
- System Coordinator: Oldrich Spaniel
- **Climate Project manager:** Gabriella Szepszo
- Administration and Finance: Andrea Sigl



# LACE MoU V for next period

Extension of LACE MoU IV to end of 2019 .



New LACE MoU V will be proposed in 2019 in framework of ALADIN-HIRLAM Consortium.

	HACE CENTRE CENT		
Memorandum of Understanding IV among the National Meteorological and Hydrological Services of Central and South Eastern			
Europe for the RC LACE			
	(Regional Cooperation for Limited Area Modelling for Central Europe) Programme		
1. Pream	able		
Reput	Vational Meteorological and Hydrological Services of Austria, Croatia, the Czech lic, Hungary, Romania, Slovakia and Slovenia, the Members of the RC LACE group, after referred to as "Members", represented by their directors/general directors:		
	cognizing e great importance of the regional co-operation in the field of mesoscale numerical		
w	eather modelling in Central and South Eastern Europe,		
	e collaborative projects shared for use in operational forecasting, bringing substantial onomic and social benefit to Members.		
• th	promotion of regional co-operation by World Meteorological Organization, in rticular in the field of high impact weather;		
	nsidering		
	e well established mutual co-operation among Members in the field of mesoscale merical weather prediction in Central and South Eastern Europe,		
• th	e mutually beneficial continuation of collaboration with Météo France and other ADIN partners.		
	e objectives and membership in ALADIN Programme,		
• th	e cooperation with the HIRLAM Programme;		
	luating		
	e networking of scientists existing around the Numerical Weather Prediction (NWP) plications in Central and South Eastern Europe,		
	e top-end technical achievements already dedicated to high-level forecasting products, e success of RC LACE Projects in the period 2008-2012 and implementation of		
op	<ul> <li>success of RC_LACE Projects in the period 2008-2012 and implementation of erational products in the fields of observation pre-processing and limited area semble prediction;</li> </ul>		
	siring		
	facilitate research and development activities of RC LACE on the Limited Area Model LADIN for the Central and South Eastern European regions in order to contribute		
	aintaining its quality and associated know-how at world-top level, technically cooperate for reaching a good level of operational applications of ALADIN		
	del at Members' services;		
Have	Have agreed as follows:		
	1		
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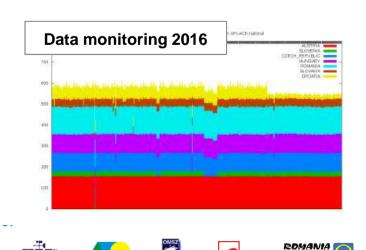
OPLACE

#### **Common operations**

 OPLACE: The common Observation Pre-processing for LACE DA and Verification.

Mode-S Mode-S

- new data added
  - Advance Technology Mirowave Sounder (ATMS)
  - AMDAR Q from Lufthansa aircraft
  - Mode-S EHS
- OPLACE access for non-LACE countries
  - agreement with Tunisia was signed & access was provided



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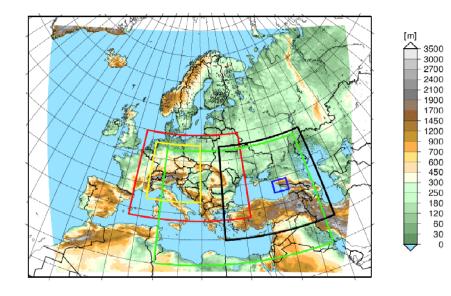
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#### **Common operations**

#### ALADIN-LAEF: no change, works on LAEF 5km, stochastic phy., EDA .....

Ensemble size	16+1
Horizontal resolution	11km
Vertical resolution	45
Runs/day	2
Forecast range	72h
Coupling	ECMWF EPS time lagged



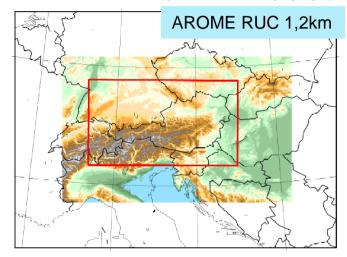
Initial perturbation	Blending
Model perturbation	multi-physics
Initial surface perturbation	ensemble DA





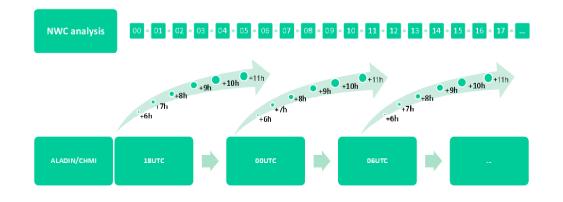
#### R&D highlights in DA

AROME–Nowcasting Domain & Topography



Vienna: AROME 1h RUC for nowcatsing

Prague: hourly updated DA for nowcatsing





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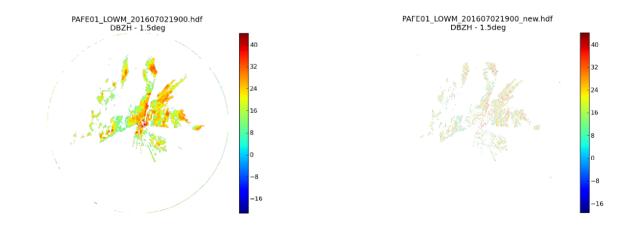
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## R&D highlights in DA

- EKF assimilation of Soil moisture (combination of Sentinel-1 and ASCAT), LST (Sentinel-3)
- Radar QC for DA
- DA Experiments with GNSS ZTD, MODE-S MRAR and EHS, radiance data such as AMSU-A, MHS, and SEVIRI.
- Tunning of VARBC





# R&D highlights in DYN

#### 1.VFE NH

 Design of vertical finite elements scheme for NH version of the model

#### 2.SL scheme

- Application of ENO technique to SL interpolations
- COMAD weights for SL interpolations
- 3. Evaluation of the dynamical core in very high resolutions
  - Clear comparison of SETTLS and ICI time schemes
  - Upper boundary conditions



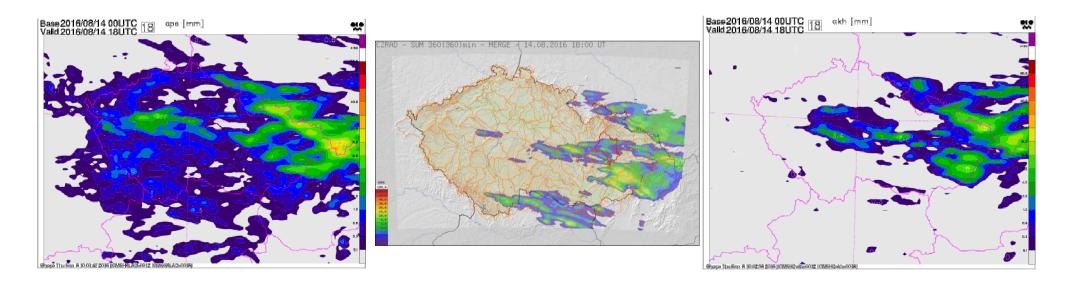
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## R&D highlights in PHY

ALARO-1 (10km – 1km):

DEVELOPMENT: TOUCANS (shallow convection closure),

ACRANEB2 (implementation of narrow band model for LW validation), updates of complementary sub-grid (up & down) drafts, and tuning of unsaturated downdraft scheme

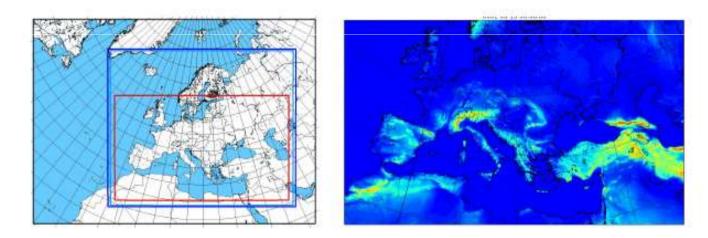




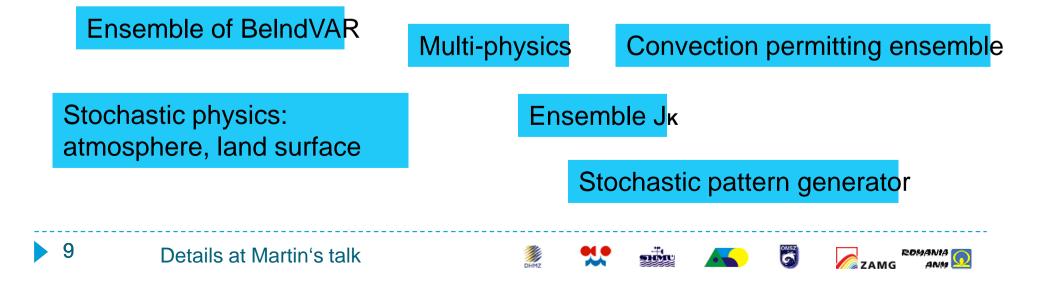


## R&D highlights in EPS

#### ALADIN-LAEF 5km resolution



Current operational 11 km ALADIN-LAEF domain borders (blue) with the nested new 5 km domain (red) - left, and the model orography of the new domain - right.





### For the next future

- focusing on AROME/ALARO at 1 -- 2.5km scale
- designing LACE future model systems, VFE, ALARO
- further developing DA, 1h RUC, radar QC, DA
- upgrading LAEF, 5km, EN-DA, multi/stochastic PHY
- R&D on convection permitting EPS



