Regional Cooperation for
Limited Area Modeling in Central Europe

LACE
nwp central europe

RC LACE 2022 overview

Martina Tudor on behalf of RC LACE MG and many researchers

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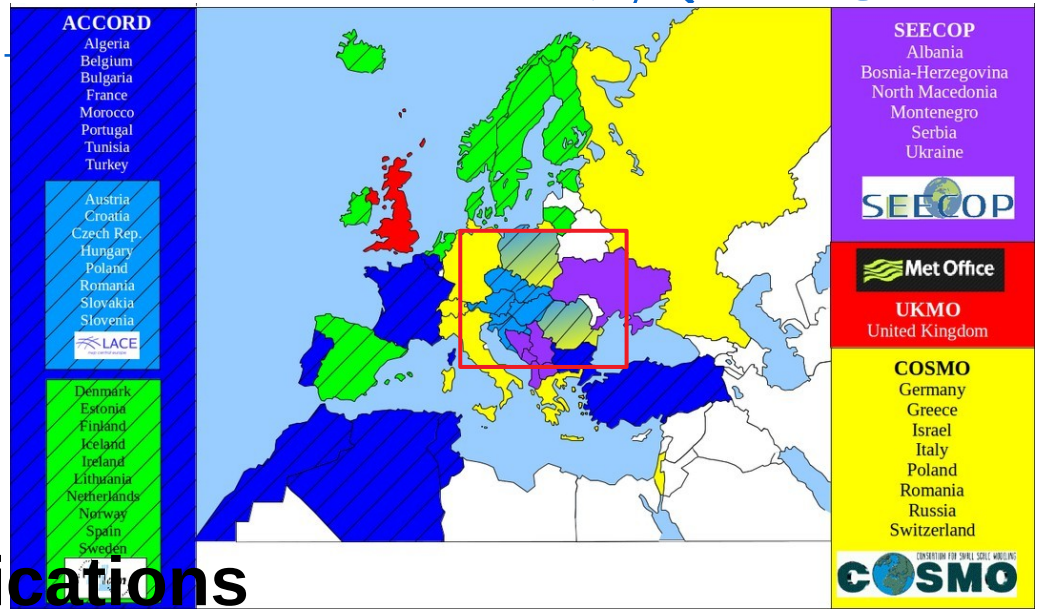
Who? What?



- New member: **Poland**
- NMSs of Austria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia
- **Common operational applications**
  - A-LAEF – Limited Area Ensemble Forecasting system
  - OPLACE – observation pre-processing for LACE
- Common research activities
- http://www.rclace.eu/?

Organisational changes

- Project Manager: Martina Tudor
- Area Leaders:
  - Data assimilation (upper air and surface): Benedikt Strajnar
  - Dynamics and coupling: Petra Smolíková
  - Physics (and surface parametrizations): Bogdan Bochenek
  - Predictability: Clemens Wastl
  - Applications and verification: Simona Tasku
- Data Manager: Alena Trojáková
- System and Code Coordinator: Oldřich Španiel

SCC main technical activities 2022

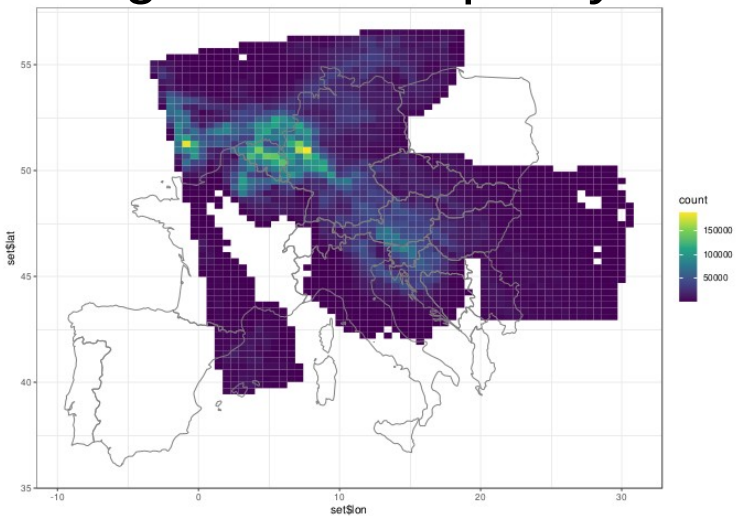
- Phasing of common cy48t1 cycle (2021)
  - Remote phasing!
- Phasing of common cy48t2 cycle
  - Only pre-operational contributions
  - Fullpos, ens, DA, physics, DDH, e923
- Export version cycle, cy46t1 preparation
- Single precision code
  - Documentation available on RC LACE forum

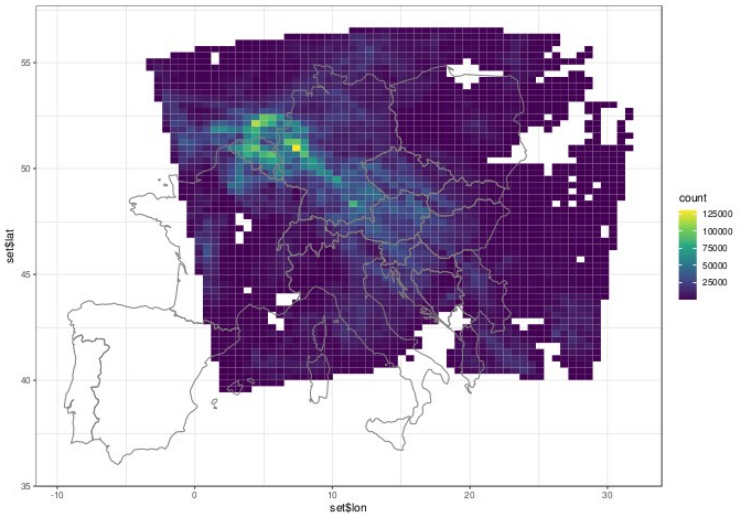
Data Manager activities

- OPLACE maintenance & development
  - New data types
- Data exchange
  - Additional measurements from LACE members not going through GTS
  - to enhance access to Mode-S data
- ODB support
  - update of simple OI and 3DVAR scripts for ALARO cy43t2/cy46t1
  - Bator cy 46t1

Data Manager activities

- exchange of high resolution aircraft Mode-S data
  - Mode-S EHS from EMADDC (KNMI)/EU upgrade
  - RC LACE adjusted for the upgrade - improved EHS data coverage & better quality





OPLACE Maintenace and Development

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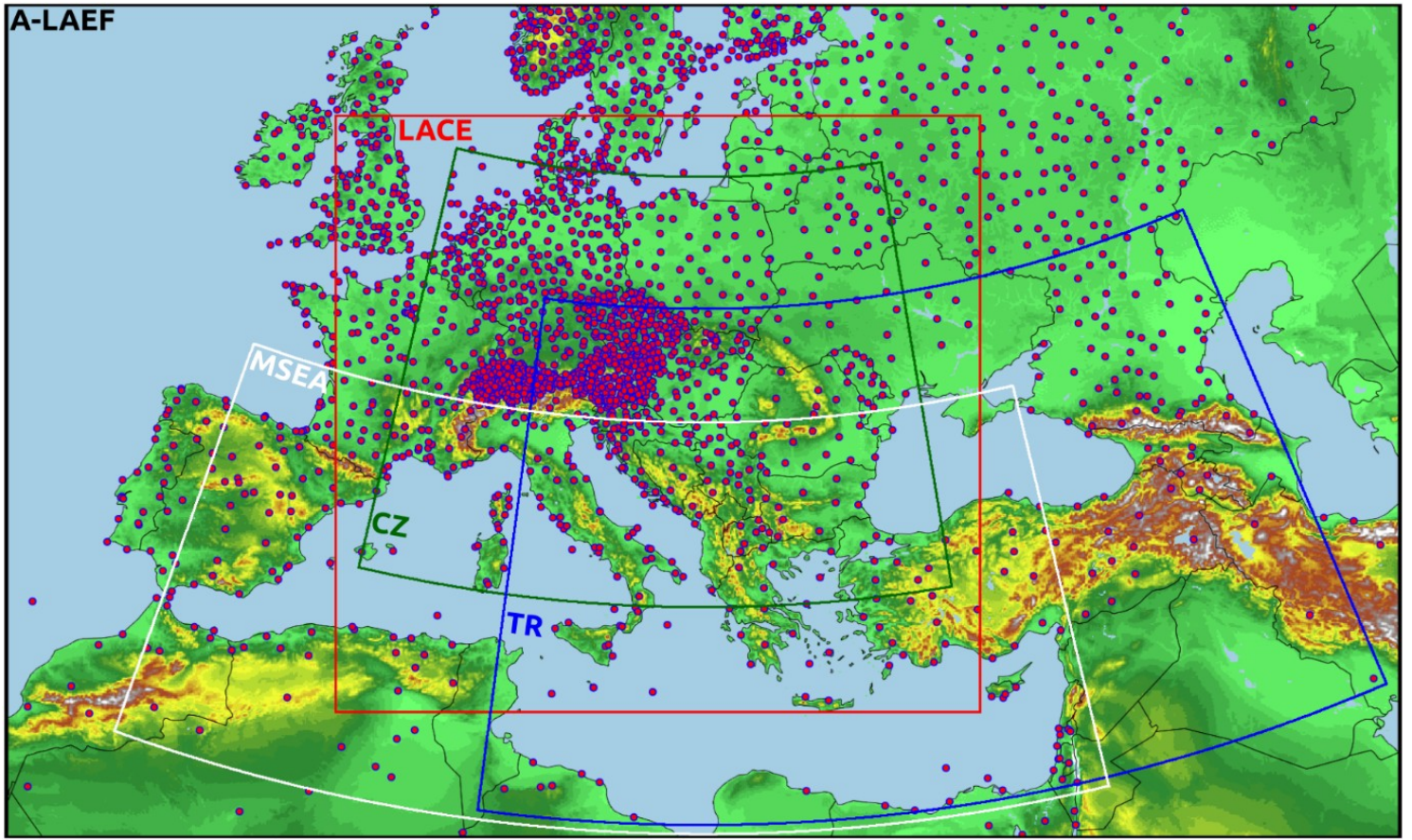
- GNSS Radio Occultation (GNSS-RO)
- new microwave sensors (MWHS-2/MWTS-2)
- Ocean winds from ScatSat-1 discontinued
- new BUFR encoding for EUMETSAT’s wind products
- GNSS ZTD test network SGO1 corrected
- OPLACE backup
- strictly formated form of OBSOUL
- Metop-A data discontinued
- High res. wind motion vectors (HRW)

A-LAEF – Martin Belluš

- Operational domain with
- data used in ESDA
- Postprocess ing domains
- Run as TC2 in ECMWF



A-LAEF

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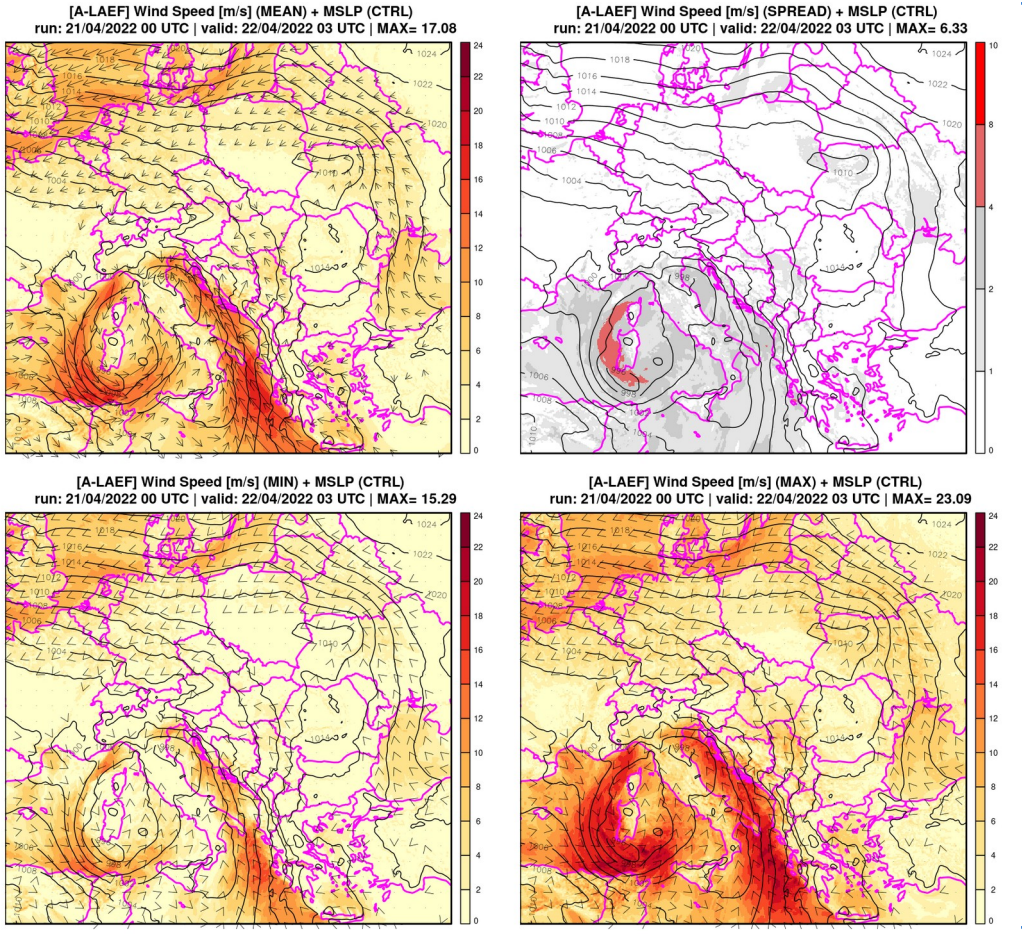
An example of operational A-LAEF maps, showing wind speed in

the ensemble mean,

the minimum of the ensemble,

the maximum of the ensemble, and

the ensemble spread, together with the mean sea-level pressure of the control run on the LACE postprocessing domain. The charts show a 27-hour forecast valid at 03 UTC on 22 April 2022.



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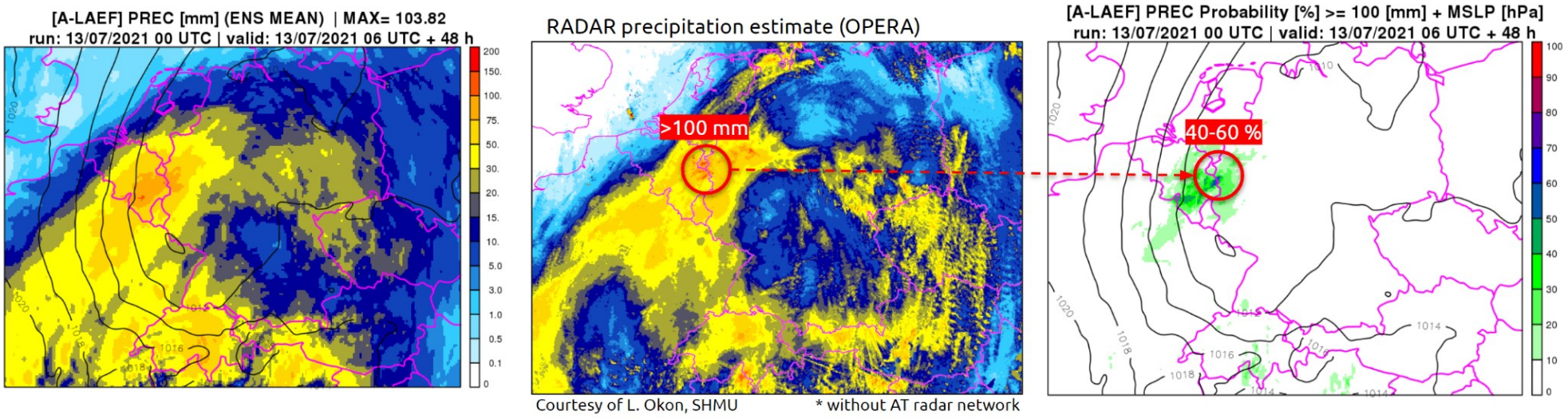
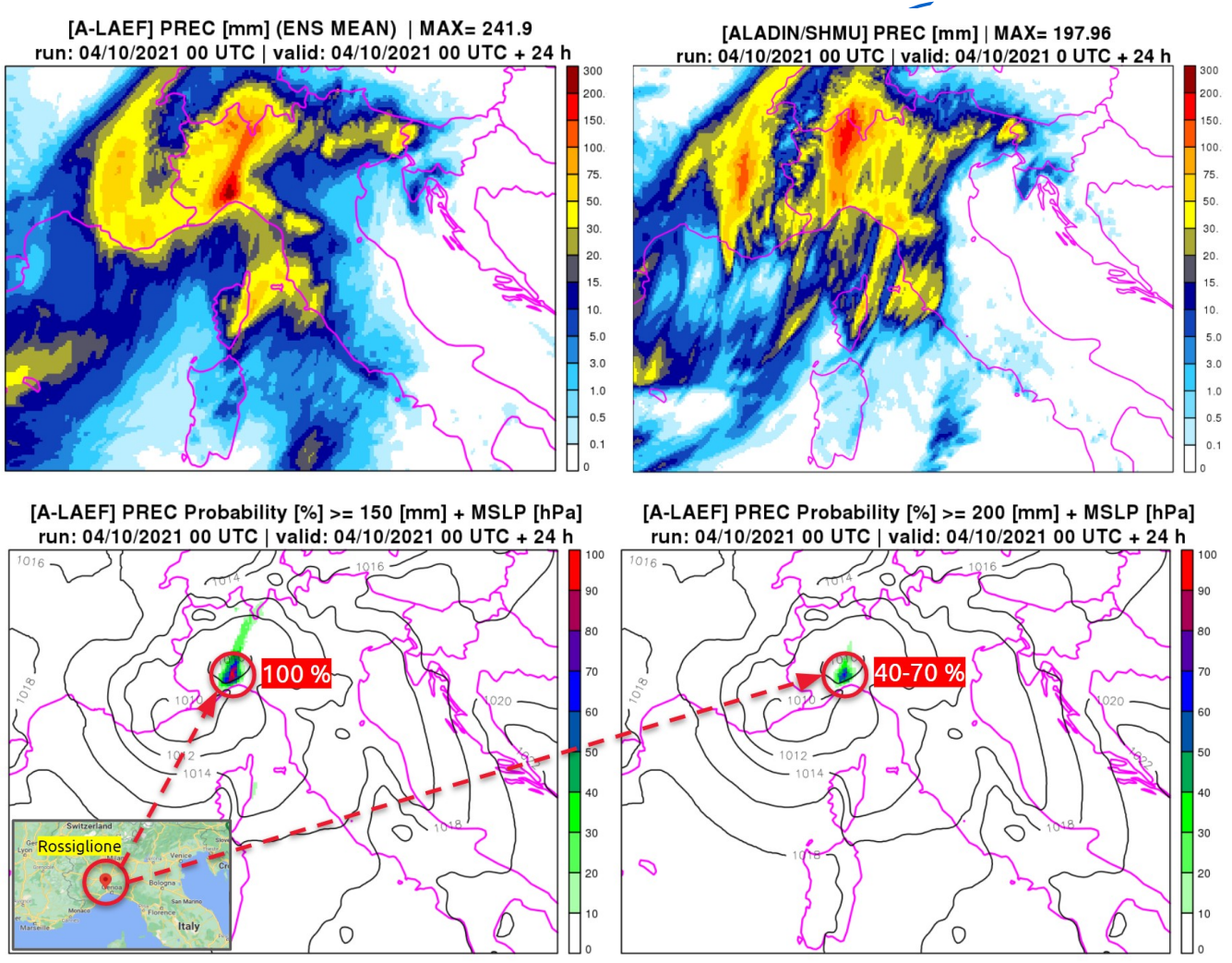


the precipitation estimate by the OPERA radar network, the A-LAEF ensemble mean forecast starting at 00 UTC on 13 July 2021, and the A-LAEF forecast starting at the same time of the probability for a precipitation threshold of at least 100 mm, valid for the 48-hour accumulation period from 13 July 2021 until 15 July 2021 (06 to 06 UTC).

A-LAEF

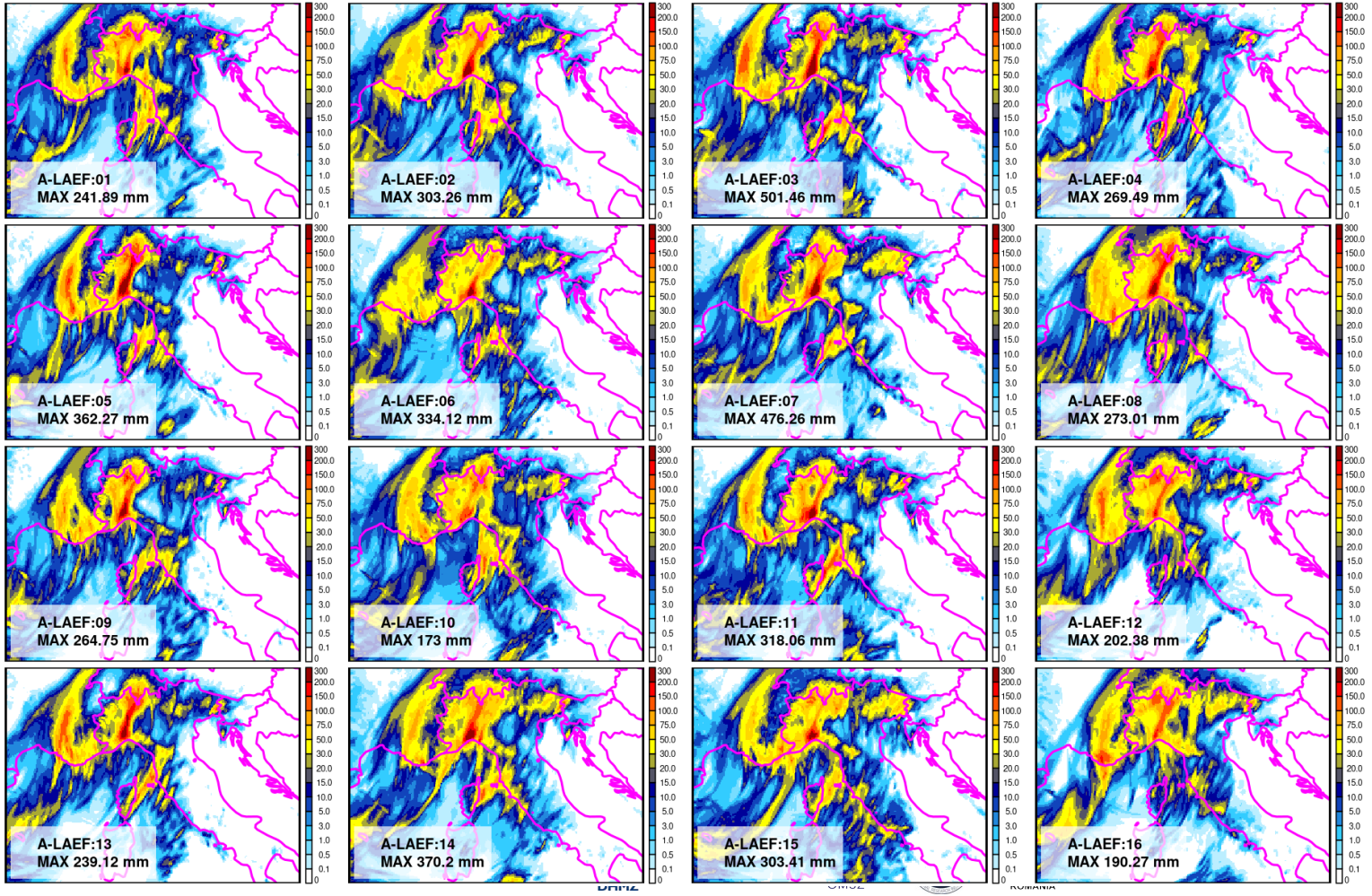
24 hr prec: the A-LAEF ensemble mean precipitation forecast, and the ALADIN/SHMU deterministic precipitation forecast, starting at 00 UTC on 4 October 2021

The A-LAEF forecast of probability for a precipitation threshold of at least 150 mm, and at least 200 mm



A-LAEF

different scenarios for 24-hour precipitation on 4 October 2021 in northern Italy by the perturbed A-LAEF ensemble members, in forecasts starting at 00 UTC on the same day. A maximum of 501 mm was predicted by member 03.



A-LAEF

- 4.8 km, linear grid, 16 members,
- Outperforms deterministic high-resolution forecast
- Uncertainties:
  - LBC from IFS
  - ensemble of surface data assimilations (ESDA) (Belluš et al., 2016)
  - Upper air spectral blending (Derková and Belluš, 2007)
  - Multi-physics (turbulence)

Thank you

- Petra Smolíková, Neva Pristov, Martin Belluš, Antonín Bučánek, Alena Trojáková, Oldřich Španiel, Radmila Brožkova, Jure Cedilnik, Jozef Vivoda, Christoph Wittmann, Jan Mašek, Mario Hrastinski, Ana Šljivić, Bogdan Bochanek, Simona Tasku, Benedikt Štrajnar, Patrik Benaček, Viktoria Hommonai, Florian Meier, Mirela Pietrisi, Maria Derkova, Antonio Stanešić, Stefan Schneider, J. Vural, Helga Toth, Viktor Tarjani, Peter Smerkol, Michal Nestiak, Martin Imrišek, Katarina Catlosova, P. Scheffknecht, Martin Dian, Balasz Szintai, J. Kemetmuller, Piotr Sekula, Matjaž Ličar, Iris Odak Plenković, Florian Weidle, Clemens Wastl, Endi Keresturi, Stjepan Ivatek-Šahdan, Mathieu Dutour Sikirić, Małgorzata Szczęch-Gajewska, Pjotr Sekula, Gabriel Stachura, Kristof Szanyi, Gabriella Toth, Katalin J. Radnoczi and Yong Wang

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