Five years of SRNWP-EPS in a nutshell

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Outline

Research activities

- Convection-permitting LAM-EPS database
- Research plan and activities
- Annual workshop

Application Tasks:

- Calibration on extremes
- LAM-EPS Extreme Forecast Index (EFI) and SOT
- Post-processed Forecasting Tools

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SRNWP-EPS

convection-permitting

LAM-EPS database

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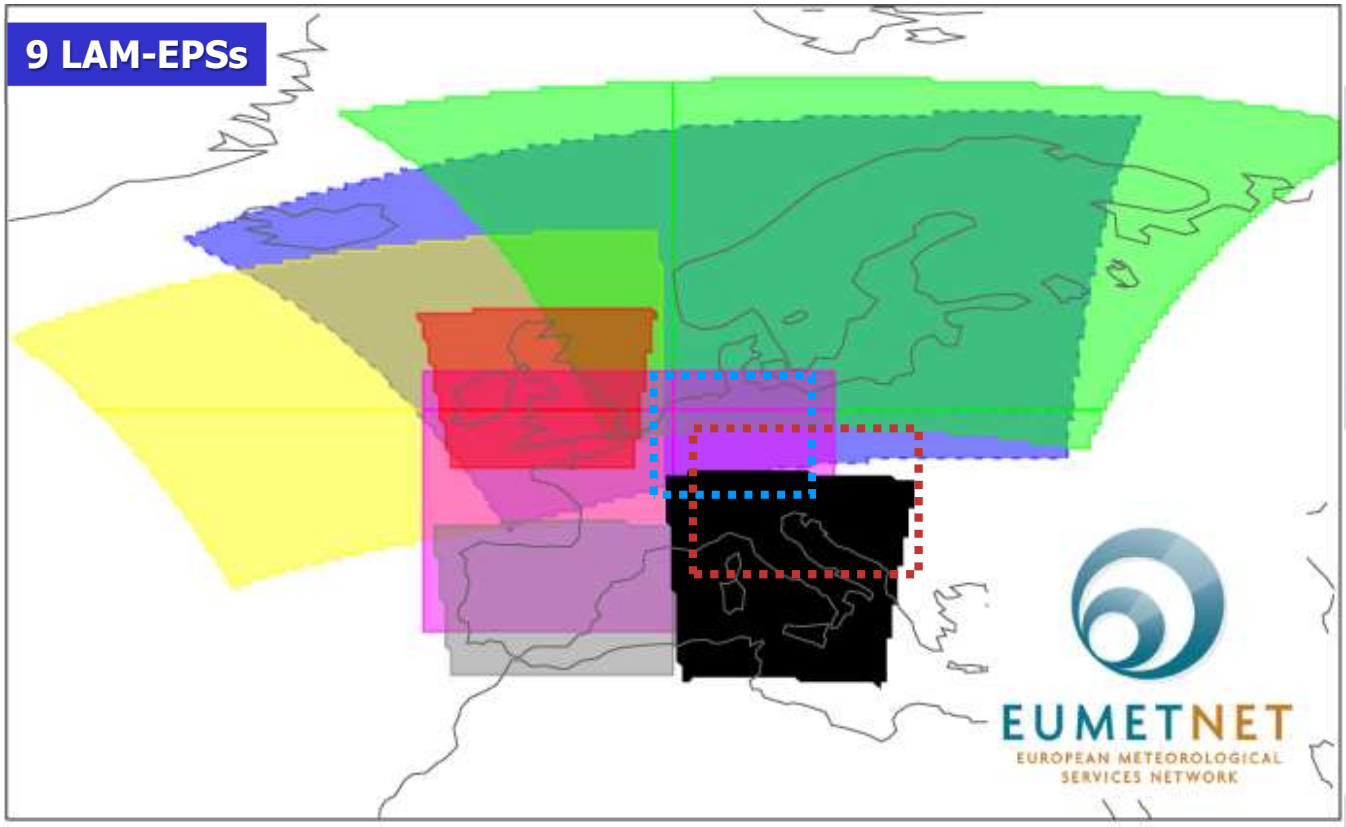
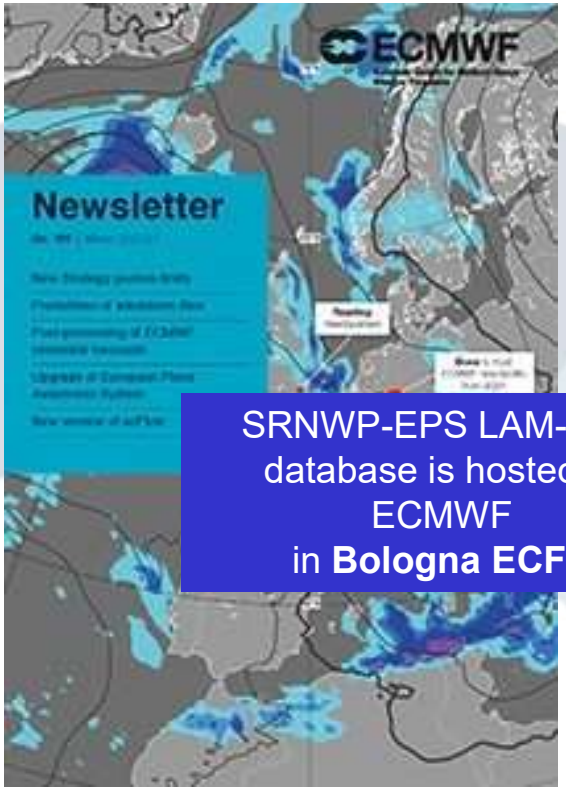
LAM-EPS domains and overlappings





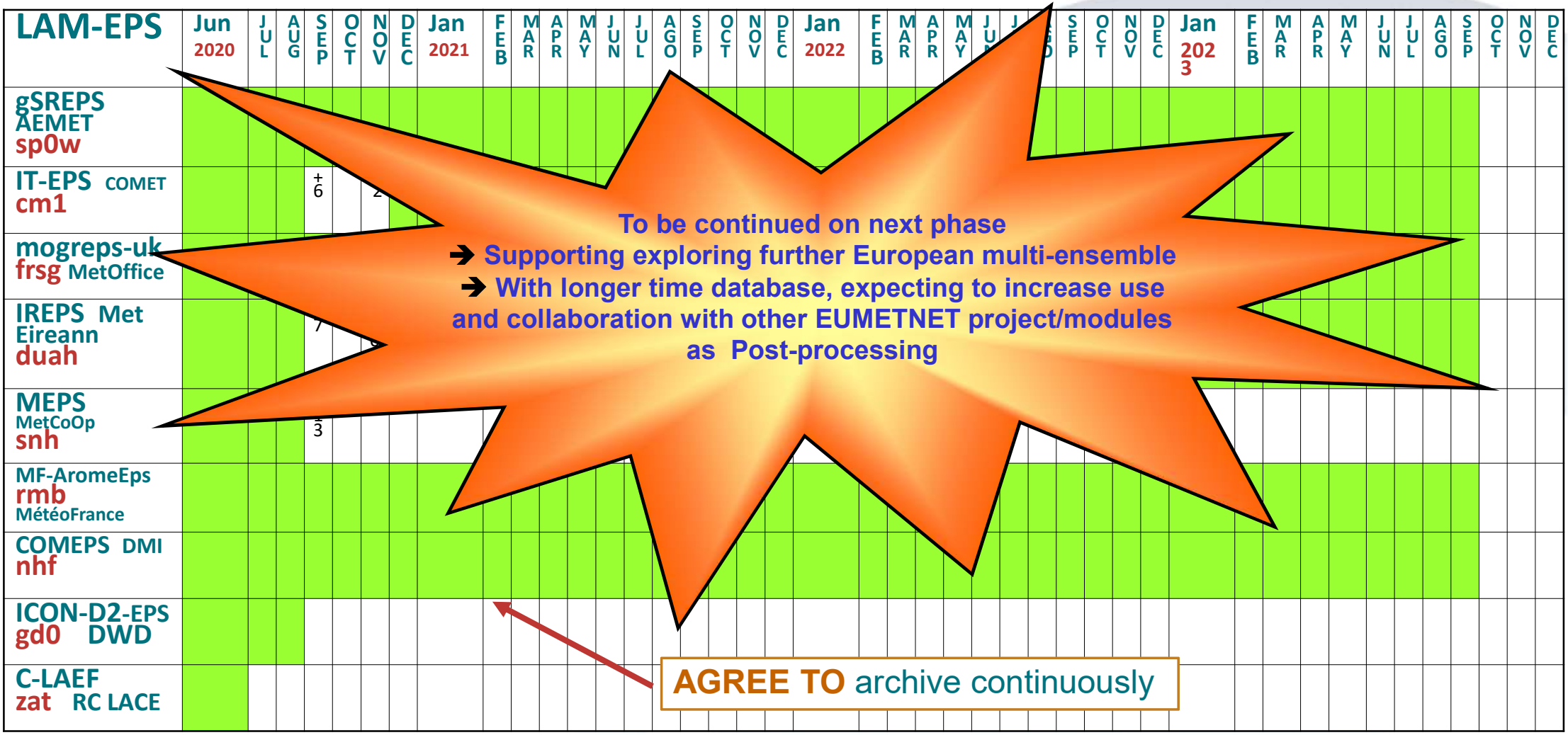
SRNWP-EPS LAM-EPS database is hosted at ECMWF in **Bologna ECFS**

Newsletter No. 166 - Winter 2020/21

EUMETNET convection-permitting ensemble database hosted at ECMWF

TOP4 Multi-model ensemble

➔ Current *off-line* SRNWP-EPS LAM-EPS database status



TOP4 Multi-model ensemble

➔ 2019-2023 phase ⇔ **Research**

➔ 2024-2028 phase ⇔ Exploring operational LAM-EPS combinations

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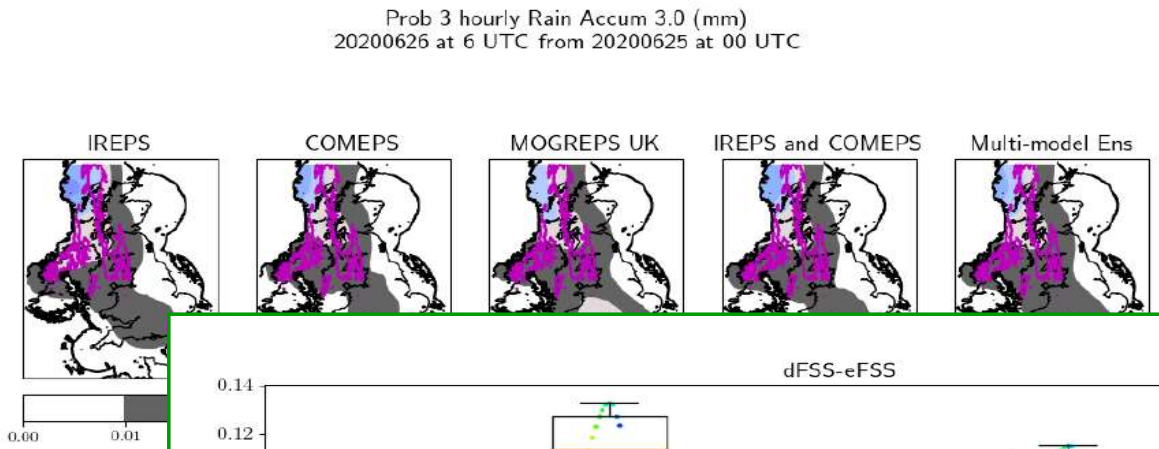
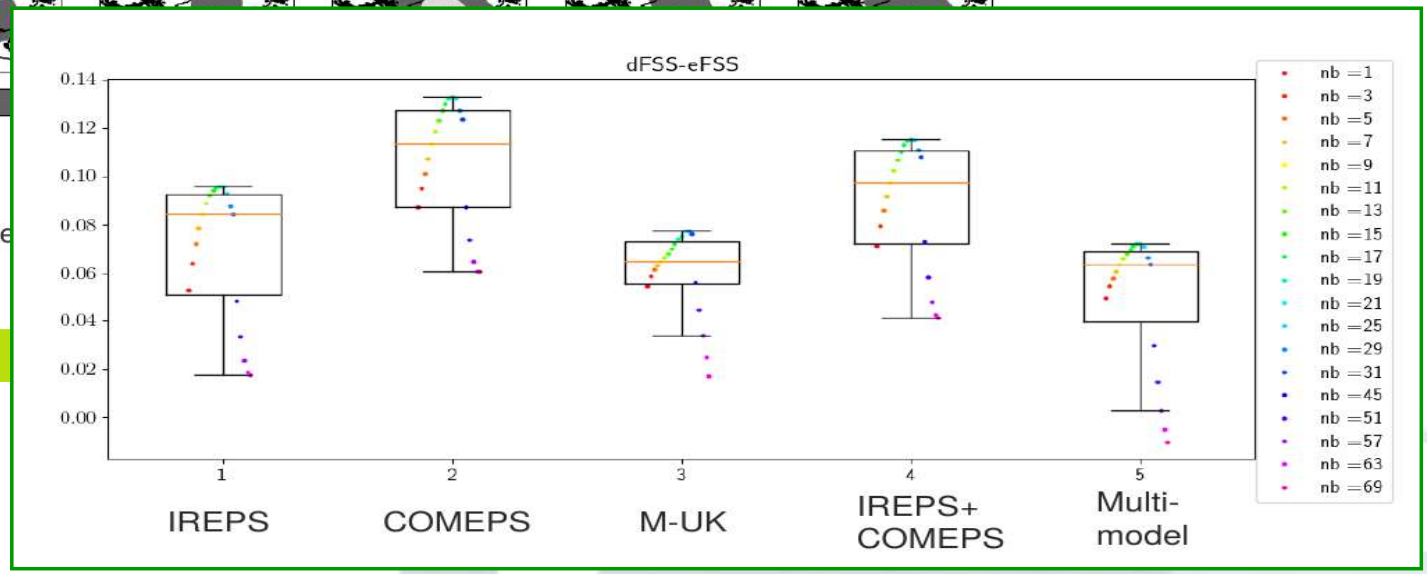
Evaluate ensemble subjectively



Three scores: S1 hit rate

Managed by Aurore Porson (MetOffice)



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Research Activities

Research Plan

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** In-kind support

Research activities

- Coordinated **Research Plan** which is discussed in Annual Workshops
  - **Scientific questions**
    - Role of different perturbations
    - Significant *spatial scales,* also for different phenomena
    - Multi-ensemble
  - Looking for answers through verification, analysis and **diagnostic** methods (common / **better metrics**):
    - Probability maps and time series
    - Reliable scale: FSS / dFSS-eFSS
    - Frequency HIW
    - Two variables spread correlation (I.Jankov)

- Focus on **HIW** and **convection**

- *SRNWP-EPS convection-permitting database* as support
  - *Specific research archive*
  - Expecting research experiments during 2023 and **next 2024-2028 phase**

Shared research Plan between ET
srnwpeps@gmail.com
My Drive ➔ srnwpEPS Research Plan
https://docs.google.com/document/d/1rdZJrfE6YTRJJ27Ls0-e7X_k_NuW_d3D
SRNWPEPS_ReserachTask_LAM-EPS_DB_v1_20211112.docx

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Research Activities

Workshops

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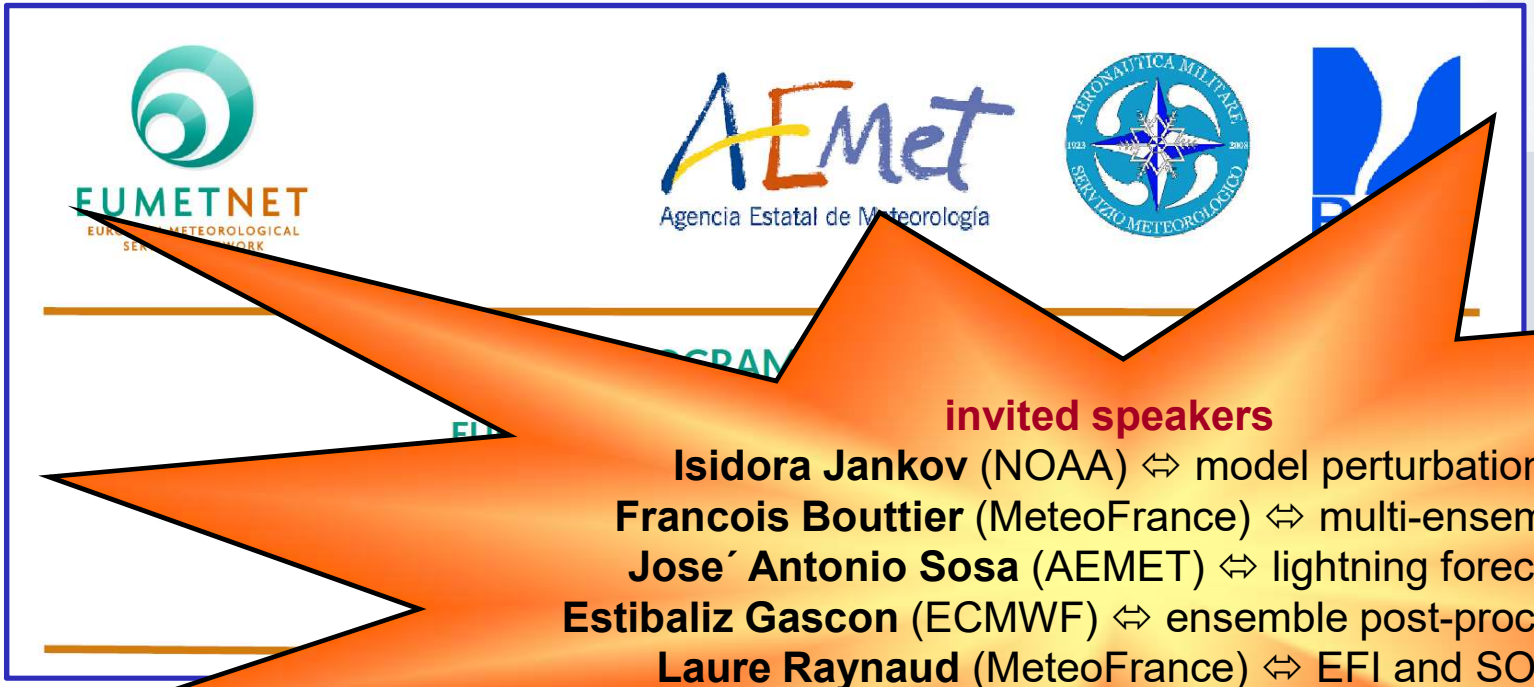
SRNWP-EPS annual meeting

Workshop 2019:

- **HIW and extremes**
- **Research Plan and experiments discussion**

MADRID



invited speakers

Isidora Jankov (NOAA) ⇔ model perturbation
Francois Bouttier (MeteoFrance) ⇔ multi-ensemble
Jose´ Antonio Sosa (AEMET) ⇔ lightning forecast
Estibaliz Gascon (ECMWF) ⇔ ensemble post-processing
Laure Raynaud (MeteoFrance) ⇔ EFI and SOT

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SRNWP-EPS annual meeting

Workshop 2020:

- **Post-processing for ensembles (joint with PP)**
- **Research Plan and experiments discussion**

invited speakers

Patrick Skinner (NOAA) ⇔ products for thunderstorm
Zied Ben Bouallegue (ECMWF) ⇔ representativness in verif
Beth Ebert (BoM) ⇔ verification for convection
Ryan Sobash (NCAR) ⇔ Machine-Learning for convection
Sandor Baran (Uni Debrecen) ⇔ ensemble calibration
Michael Scheuerer (NOAA) ⇔ ANN for precipitation

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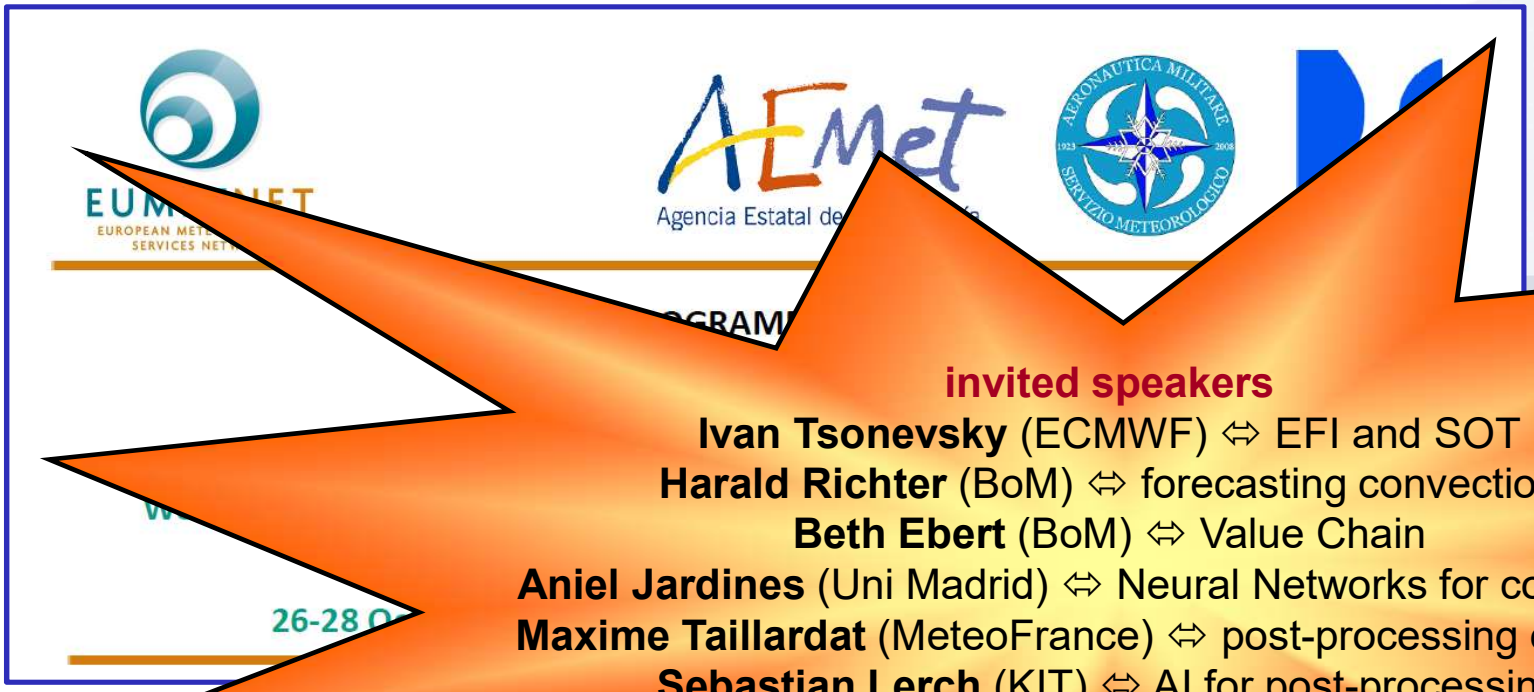
SRNWP-EPS annual meeting



Workshop 2021:

- **Verification for extremes and Value Chain**
- **Research Plan and experiments discussion**

invited speakers

Ivan Tsonevsky (ECMWF) ⇔ EFI and SOT
Harald Richter (BoM) ⇔ forecasting convection
Beth Ebert (BoM) ⇔ Value Chain
Aniel Jardines (Uni Madrid) ⇔ Neural Networks for convection
Maxime Taillardat (MeteoFrance) ⇔ post-processing extremes
Sebastian Lerch (KIT) ⇔ AI for post-processing

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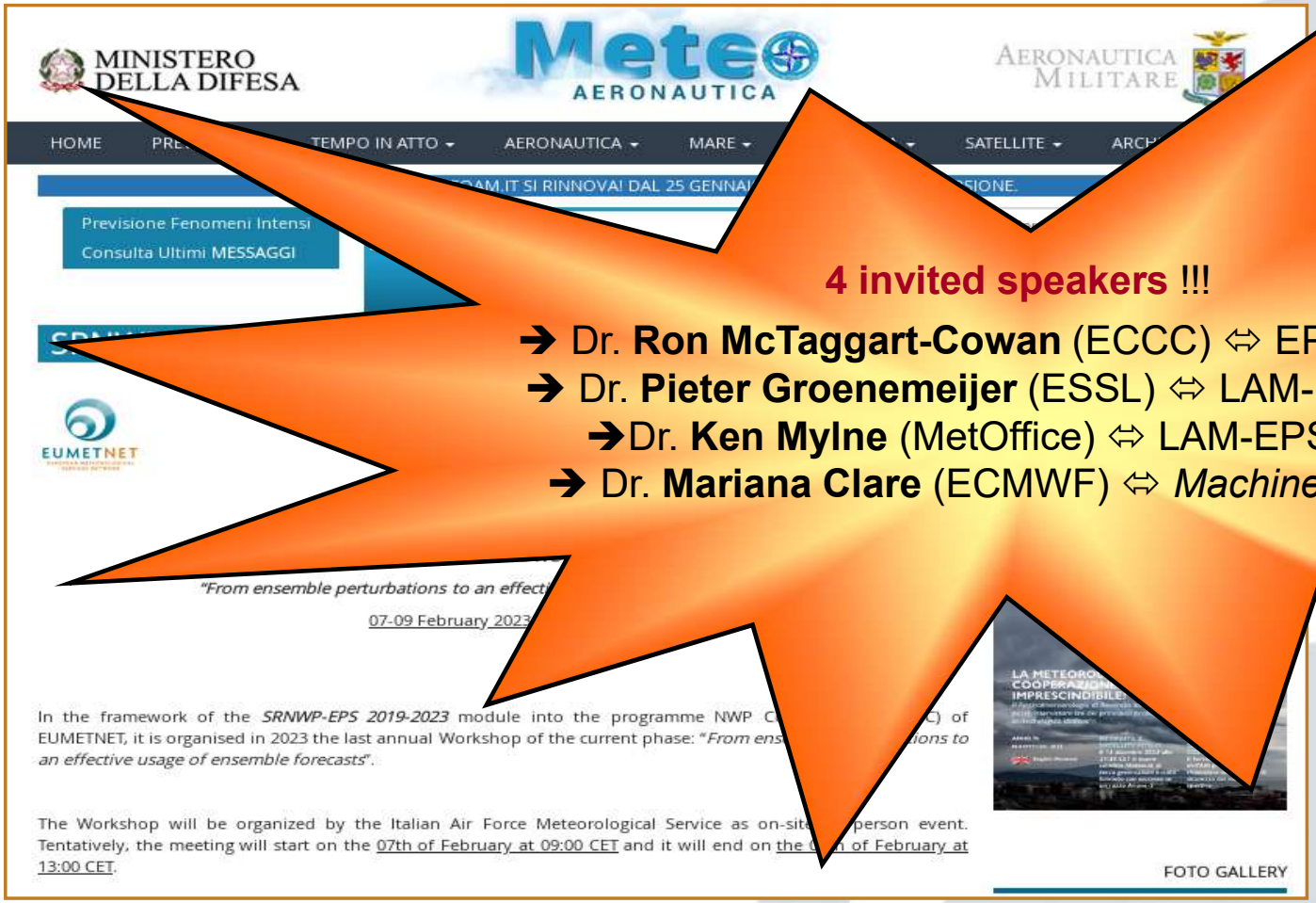
SRNWP-EPS annual meeting

"From ensemble perturbations to an effective usage of ensemble forecast"
http://www.meteoam.it/page/srnwp-eps-annual-workshop-2023



4 invited speakers !!!

➔ Dr. **Ron McTaggart-Cowan** (ECCC) ⇔ EPS research
➔ Dr. **Pieter Groenemeijer** (ESSL) ⇔ LAM-EPS usage
➔ Dr. **Ken Mylne** (MetOffice) ⇔ LAM-EPS usage
➔ Dr. **Mariana Clare** (ECMWF) ⇔ *Machine-Learning*

Workshop 2022/2023:

- **Usage of ensembles in Europe**
- **Research Plan and experiments discussion**
- **What in next phase**

ROMA

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SRNWP-EPS status

Application Tasks

EPS_0 SURVEY

Survey summarising information from the 21 Members participating to the project about their convection-permitting LAM-EPS status, plans and needs on the topics that have to be addressed in the Application Tasks of the project.

➔ **16 members** and **2** observers: DWD and MétéoFrance
➔ Available at EUMETNET portal

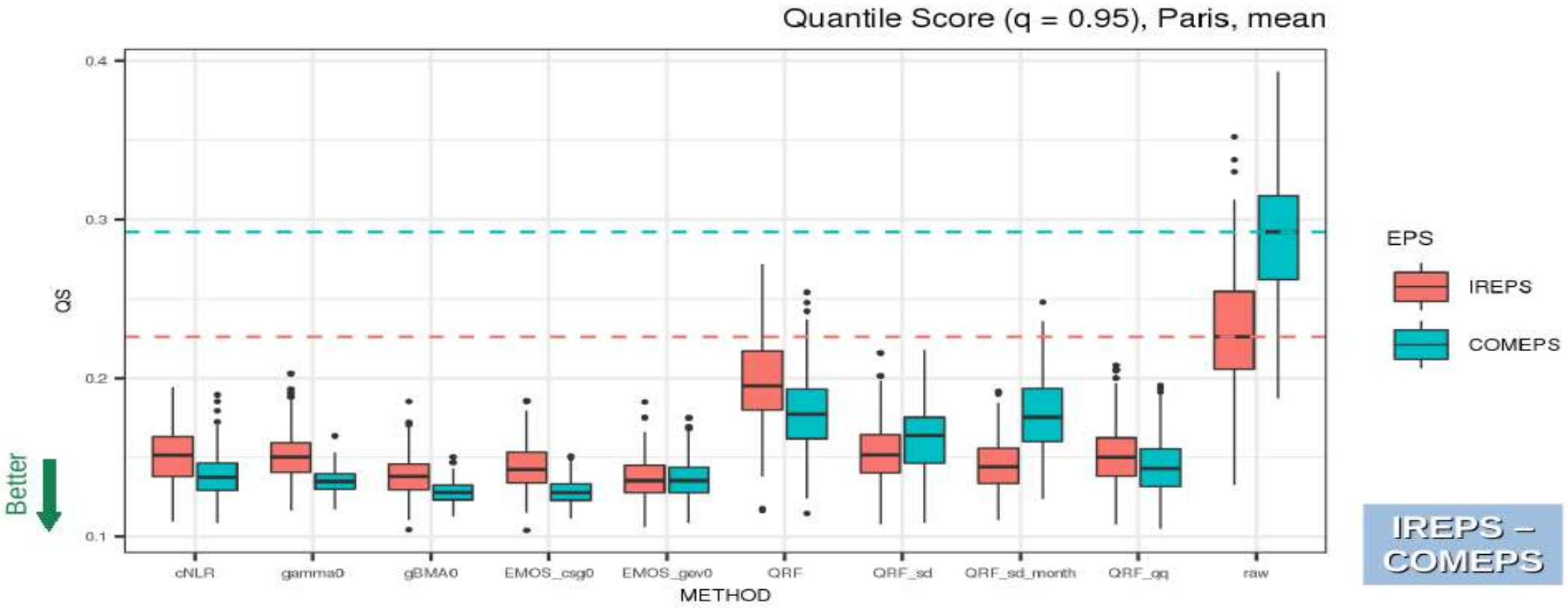
3.2 Requirements – high-impact weather

Centre	End users	probabilities	products	Spatial/temporal resolution
AEMET	Forecasters,...	Very crucial	storm wind gust, **thunderstorm** forecast) and aviation (icing, turbulence) warnings	3km,3h (1 Km, 1h some areas)
COMET	Forecasters, military aviation	Very important	Ice, turbulence, wind storm	2 km, 1h
FMI	Forecasters, general public,special customers/authorities	**Important** for **forecasters** and special/professional customers, **less important** for general **public**	calibrated probabilistic output from most relevant weather variables	Up to 15 min for nowcasting
IMWM Poland	forecasters, transportation services,security and crisis management	important	gusts/microbursts, strong winds (power outages),icing, **fog**, **thunderstorm forecasts**	Conv-Permitting Scale, 1 h
IPMA Portugal	forecasters, civ.prot, selected clients	important	...to increase the usefulness of the data already available	**>=5km, 3h**
MCH	forecasters and public	Very crucial	Wind, **precipitation, snow**	km scale
Met Eireann	Forecasters, aviation, loc. authority(engin.)	Not essential but highly desirable	Wind, **precipitation**, **fog** (icing/turbulence for aviation ??)	2.5 km, 1h
Met.no Norway	Forecasters ,civ. Prot., road/ infrastructure.,defence,gov/muni c. auth.	Probability is crucial for some users "color"	**hydrology/land slides**/avalanches/**floods**	For 0-24h lead time, or at least 0-12h, municipal
Met Office	---	---	to keep in touch with the progress being made	---
RMI Belgium	Forecasters (general warning,road)	very important	**thunderstorms**,gusts,torrential rain,**fog**, temperature and **radiation**	**500m, 15 minutes**
SMHI Sweden	Forecasters , web/app and authorities (in the future)	important	Products that's shows the possibility for reaching all our warning criteria (possible change thresholds)	counties

SRNWP-EPS Application tasks

API ➔ Application Programming Interface

Results – daily precipitation



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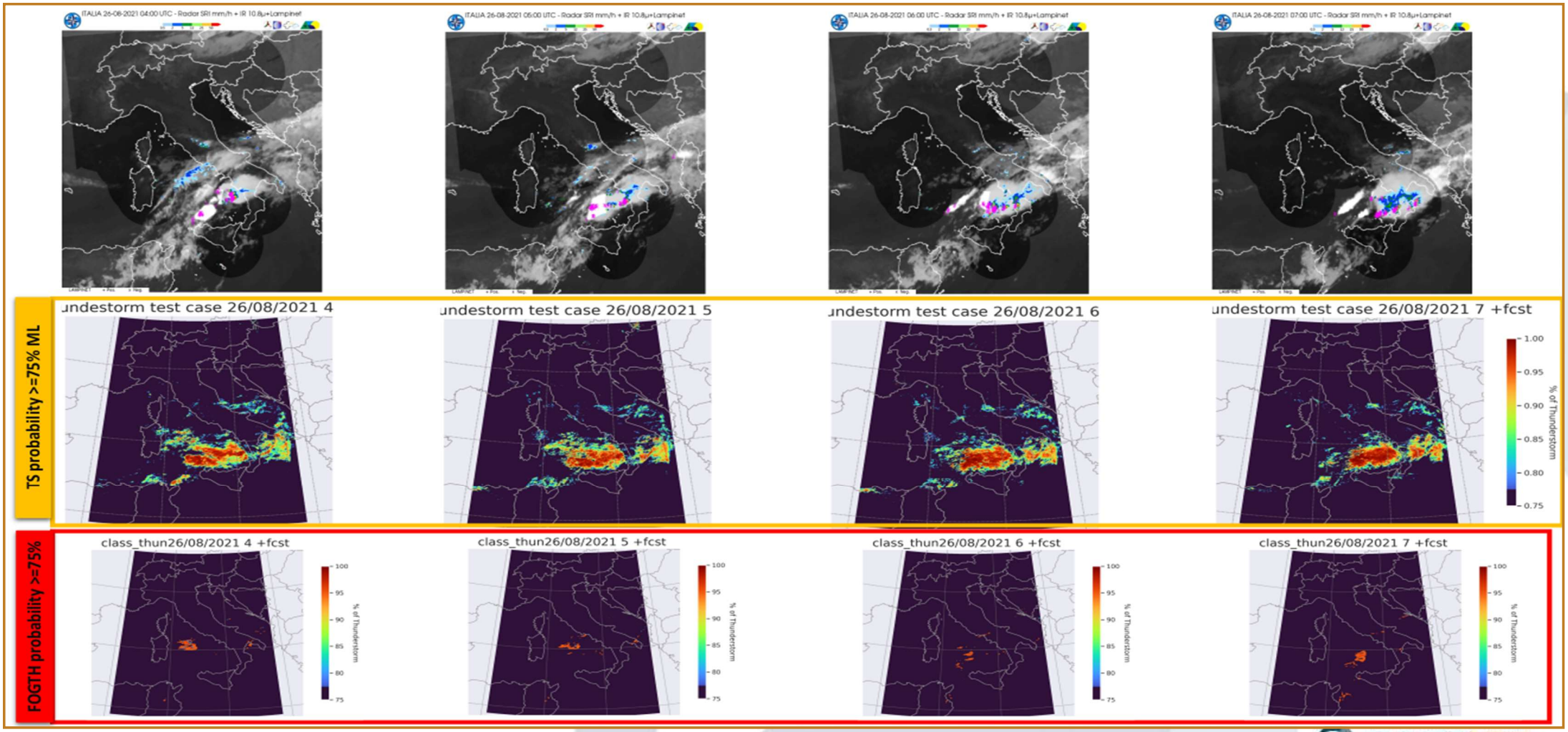
SRNWP-EPS Application tasks



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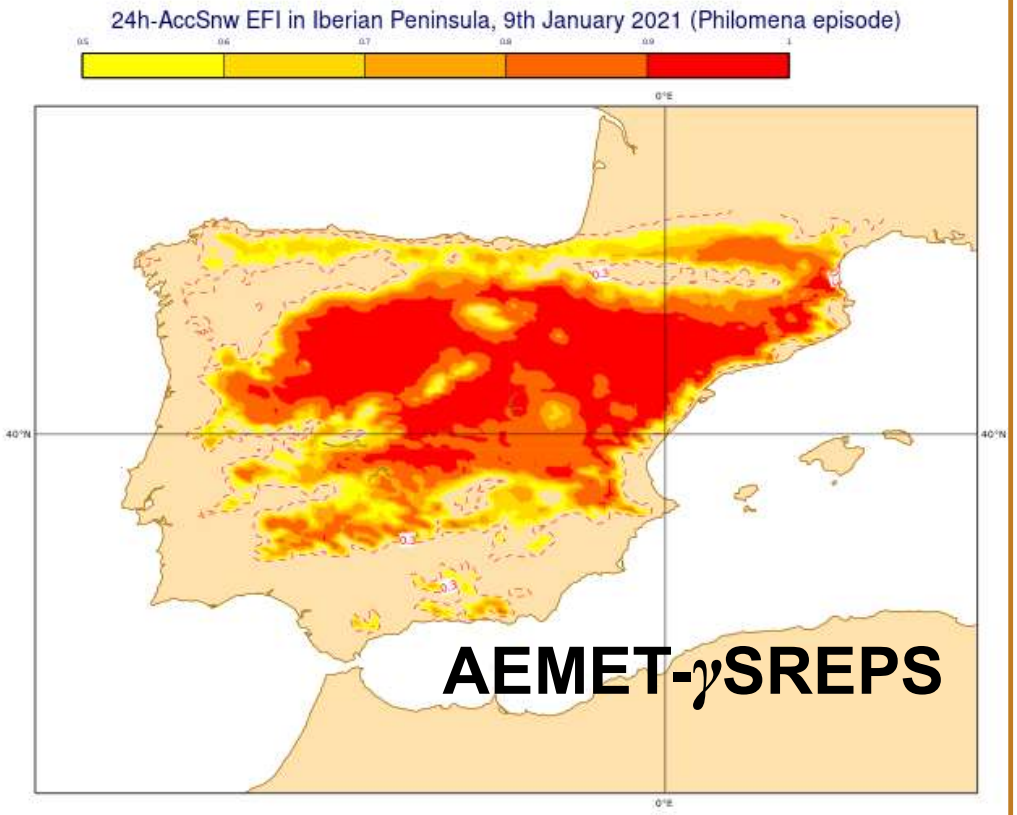
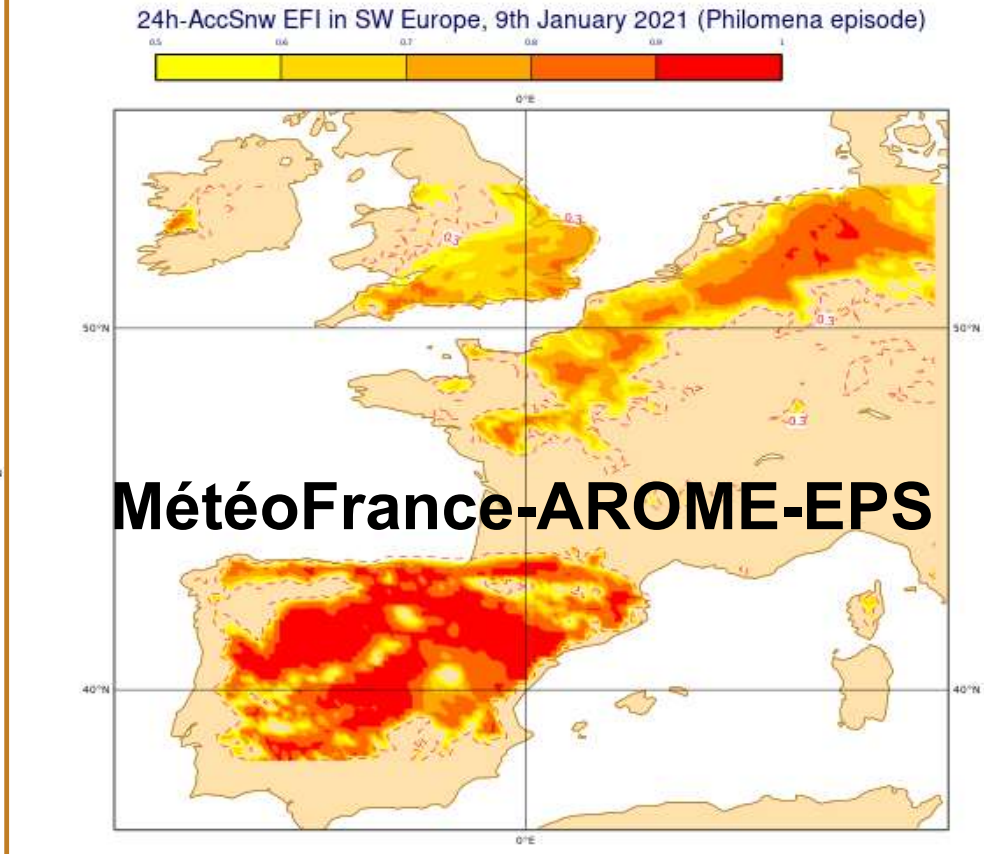
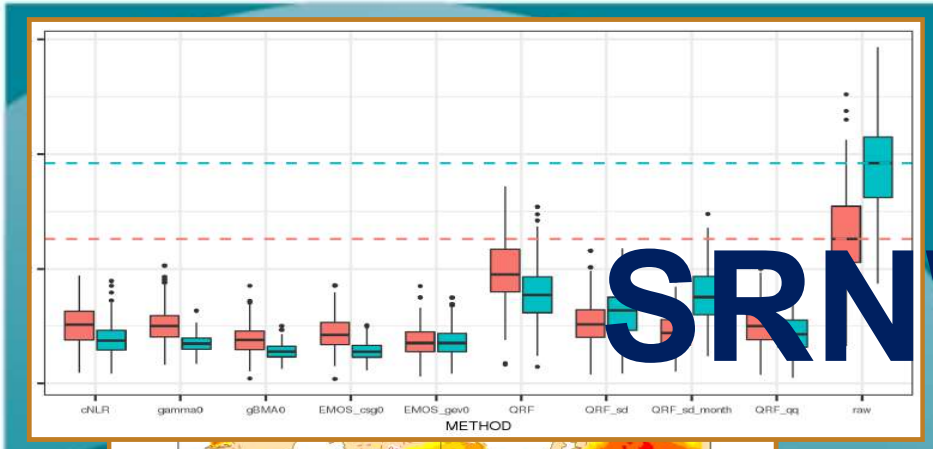
SRNWP-EPS Application tasks





EFI ➔ Extreme Forecast Index
SOT ➔ Shift Of Tails



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SRNWP-EPS Annual Workshop 2022/2023

EUMETNET SRNWP-EPS 2019-2023

2022/2023 ANNUAL WORKSHOP

"From ensemble perturbations to an effective usage of ensemble forecasts"

07-09 February 2023, Rome (Italy)

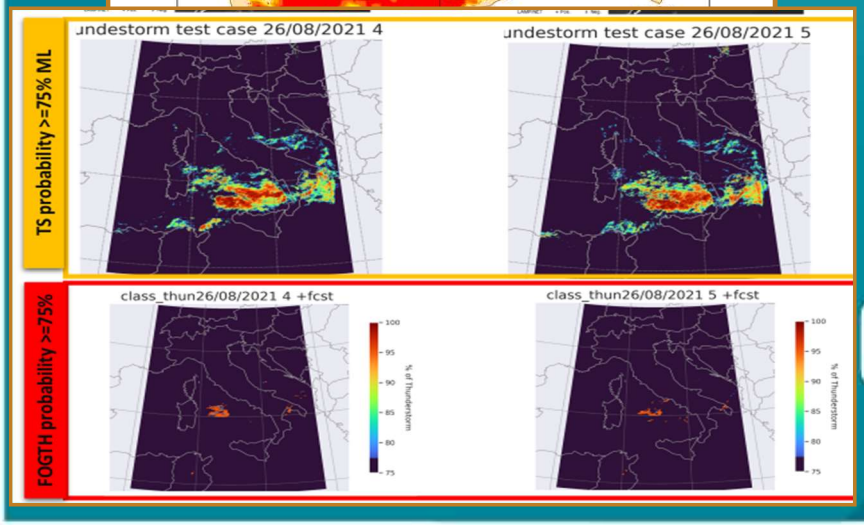
Workshop on "LAM-EPS verification on extremes and forecasting value chain for High Impact Weather"

26-28 October 2021, BlueJeans video-conference meeting

27-30 October 2020, BlueJeans video-conference meeting

22-24 October 2019, Madrid (Spain)

Thank you for your attention!



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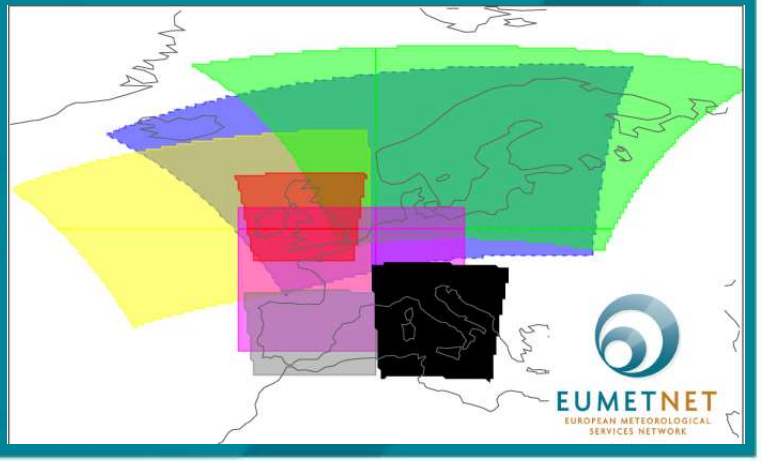

Thank you for your attention

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