MISTRAL, la piattaforma italiana degli open data meteorologici e le sue funzionalità Evento Online - 23 Novembre 2020

MISTRAL Meteo Italian Supercomputi

Meteo Italian Supercomputing Portal

Quale futuro per Mistral?

Tiziana Paccagnella



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Content:

Brief summary on MISTRAL basic assumptions

Some considerations about the future of MISTRAL

Questions and comments

Brief summary: MISTRAL basic assumptions

Since the end of the 90s Italy, through the Meteorological Service of the Air Force, has joined the COSMO International Consortium for the development of the COSMO limited area model



Germany	ZGeoB
Italy	CIRA
Italy	ARPAE
Italy	ARPA P

 Zentrum für GeoInformationswesen der Bundeswehr Centro Italiano Ricerche Aerospaziali Agenzia Regionale per la Prevenzione, l'Ambiente e l'Energia Emilia Romagna riemonte Agenzia Regionale per la Protezione Ambientale Piemonte

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ARPAF-SIMC

At the national level USAM, ARPA SIMC and ARPA Piemonte signed the **LAMI** agreement to cooperate in management and development of NWP modeling on an operational basis at national level

Since 2004 (DPCM 27/2/2004) LAMI is the national reference system in support of the Civil Protection

HPC resources and support for the LAMI suites managed by ARPAE are provided by CINECA





CINECA



LAMI operational suites implemented and managed by ARPAE-SIMC Computer resources : CINECA with funds from DPCN





BCs from ECMWF IFS IC from AM-Rome LETKF analysis

Two runs per day +72





BCs from COSMO 5M IC from the new LETKF by ARPAE SIMC

Two runs per day +48 and Eight runs per day +18 (Rapid Update Cycle)

KENDA

Km-scale ENsemble-based Data

Assimilation

Local Ensemble Transform Kalman Filter (LETKF, Hunt et al., 2007)



 $\mathbf{x}^A = \mathbf{x}^B + \mathbf{K} \left[\mathbf{y}^o - H(\mathbf{x}^B) \right]$

analysis for a deterministic forecast run : use Kalman Gain Kiziana Paccagnella of analysis mean

Ensemble Systems @ ARPAE-SIMC:

COSMO-LEPS by ARPAE SIMC for the COSMO Consortium

ECMWF EPS Initial and boundary conditions

20 members, 7(5) km H.R. 2 runs per day +120



Operational at ECMWF since 2002 as Time Critical Application RUN thanks to COSMO Countries resources at ECMWF

ARPAE SIMC COSMO 2I EPS

ECMWF EPS / AM Rome boundary conditions

Self-generated perturbed Boundary conditions by ARPAE LETKF KENDA

20 members, 2.2 km H.R. 1 run per day +48





Brief summary: needs prior to the MISTRAL project

Huge amount of products to be archived

Real-time exchange of data and products between partners (mutual back-up) Huge amount of operational disseminations COSMO-LAMI Products visualization platform

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Weather & Climate "is" Big Data



Brief summary: needs prior to the MISTRAL project

Also considering the favorable environment due to: the Italiameteo institution - construction phase

The Bologna Technopole (ECMWF computer Centre, CINECA-CNAF, BIG Data Association)

The potential perspectives related to Mirror Copernicus

the MISTRAL project was the perfect opportunity to optimize the existing and design a highly technological and futureoriented system

ELEMENTS AT THE BASE OF MISTRAL

	Huge amount of products to be archived		Real-time exchange of data and products	a	Huge amount of operational disseminations	COSMO- LAMI Products	
		1	between partner (mutual back-up	S)		visualization platform	
	MISTRAL as open data portal to foster the use of	d	meteorological ata from various observation networks, both	F	ligh level post- processing thanks to the availability of	Advanced visualization platform	
meteorological data sets.	pu	ublic and private,		HPC			

Possibility to extend to other modelling system e.g.air quality oceanography

The future of MISTRAL

A lot has been done but it is necessary to proceed with

• work for the maximum application of the principle of open data to make the most of the potential use of meteorologica data and products (for agricolture, health, transport, etc....).

Public and private must be able to work in an increasingly complementary way (MIRROR Copernicus is a very promising initiative in this direction).

• Better provide for the sustainability of MISTRAL

The future of MISTRAL

How to manage and guarantee the sustainability of MISTRAL (allowing its use also by private individuals to develop value-added services ?

In the next years MISTRAL will be considered as one of the components of the COSMO-LAMI system. MISTRAL will be enriched and optimized based on the planning between the LAMI partners and DPCN and with the cooperation of CINECA.

Further contributions could come from other initiatives:

- ITALIAMETEO
- SNPA ARPAS
- MIRROR Copernicus
- Other EU project (the h2020 highlander project is already an example).
- Other scientific projects
- Cooperations with public and private interested in developing applications
- Associations/Foundations (e.g. the BIGDATA association) interested in
 Tiziana Paccagnella bigdata and deep learning technologies.
 ARPAE-SIMC

Now..... Questions or comments

Thank you