Priority Task CORSO-A

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Motivation

PP CORSO obtained the successful results. The main result of FDP part of PP CORSO was the implementation of high quality NWP system, which the forecasters of Organizing Committee and of sport venues have used as a basic.

Some aspects obtained results could be further researched and could be useful for implementation and investigations in whole COSMO community.

The new PT "CORSO-After" ("CORSO-A") should meet these developed challenges for implementation in COSMO technologies and investigations.

Goal

To transfer of results of the PP CORSO to COSMO software, applications and know-how:

- **the implementation of versions COSMO-1km,**
- **the realization of down-scaling postprocessing tools for mountain area,**
- **the development of archive for development of convective-resolution EPS,**
- **the development of instructions for forecasters for use the results of meso-scale deterministic and EPS results.**

General information

- **The resources requested:**
  1.0 FTE / 1 year
- **Period:**
  09.2014 - 08.2015
- **Participants** **/** FTE:
  ARPA-SIMC / 0.10;
  DWD / 0.05;
  Greece / 0.05;
  MeteoSwiss / 0.15;
  Russia / 0.65

Subtask 1

The guidance of the optimal domain's size selection for 1.1 km resolution of nested COSMO models for the regions with complex mountain relief

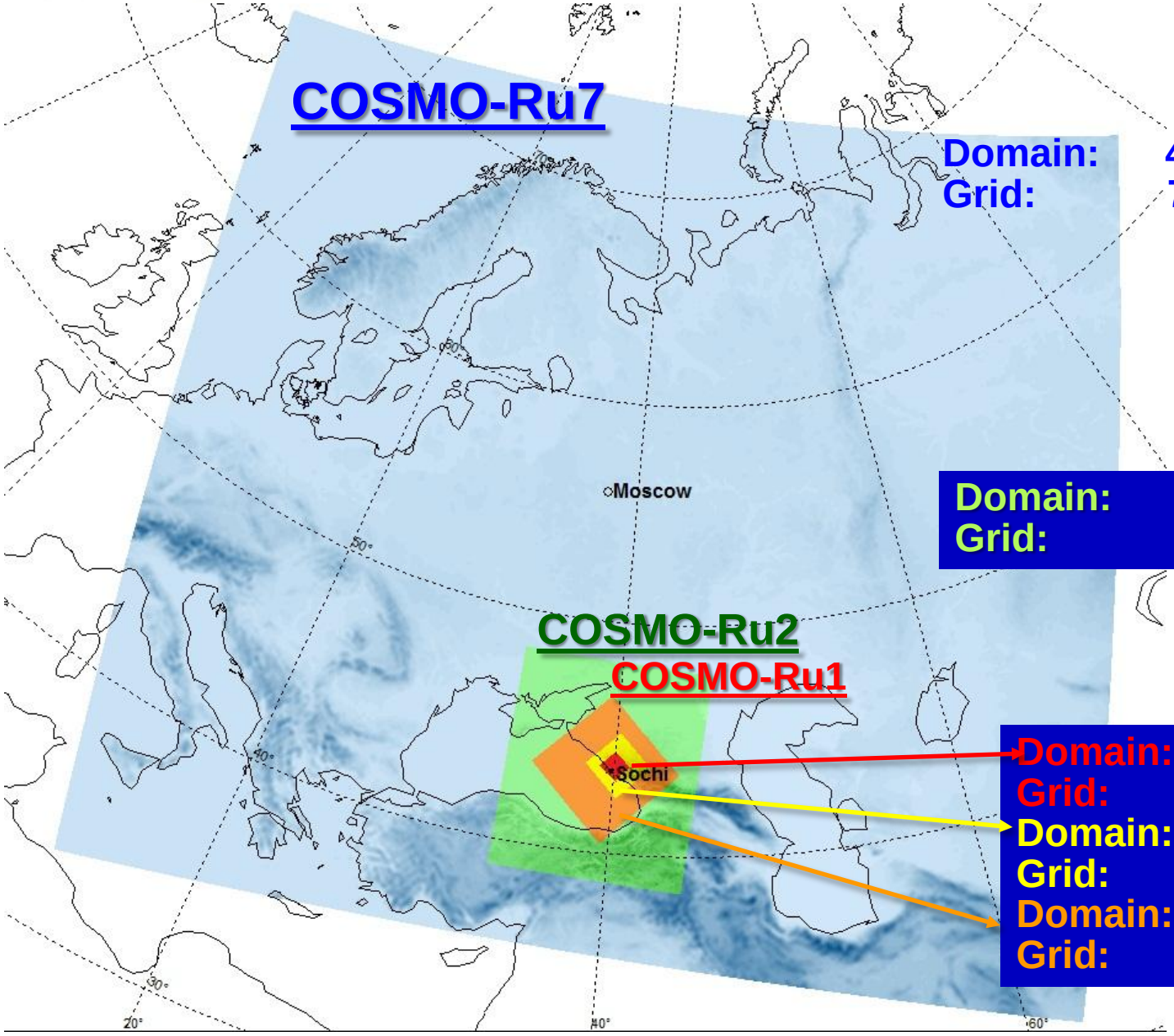
Goal

To formulate and to prove the selection of model's domain size for COSMO-1 model runs for disseminate this experience for create the similar technologies for detailed calculations on mountain domains in condition of limited computing resources.

Participants **Resourse 0.30**

Russia	(G.Rivin, M.Shatunova)	0.25
Germany	(U.Blachak)	0.05

Model domains



COSMO-Ru7

Domain: 4900 km x 4340 km
Grid: 700 x 620 x 40

Domain: 900 km x 1000 km
Grid: 420 x 470 x 50

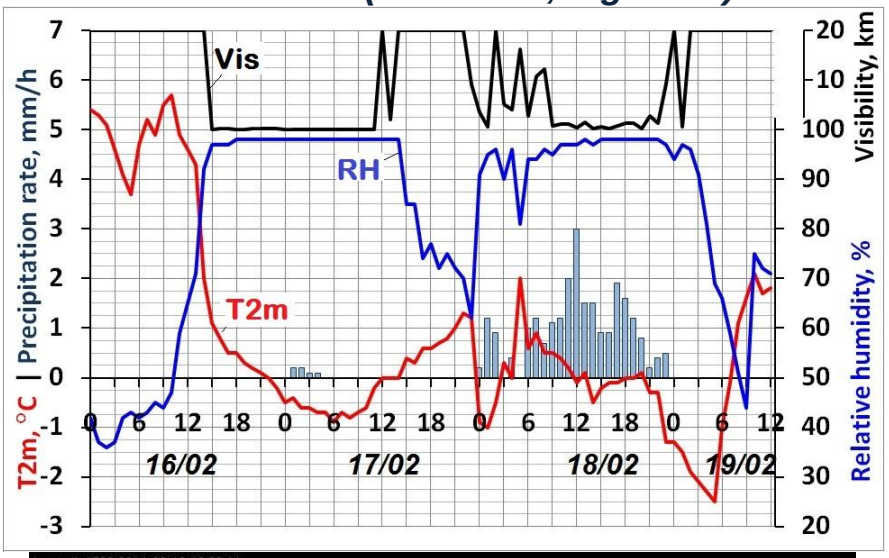
COSMO-Ru2

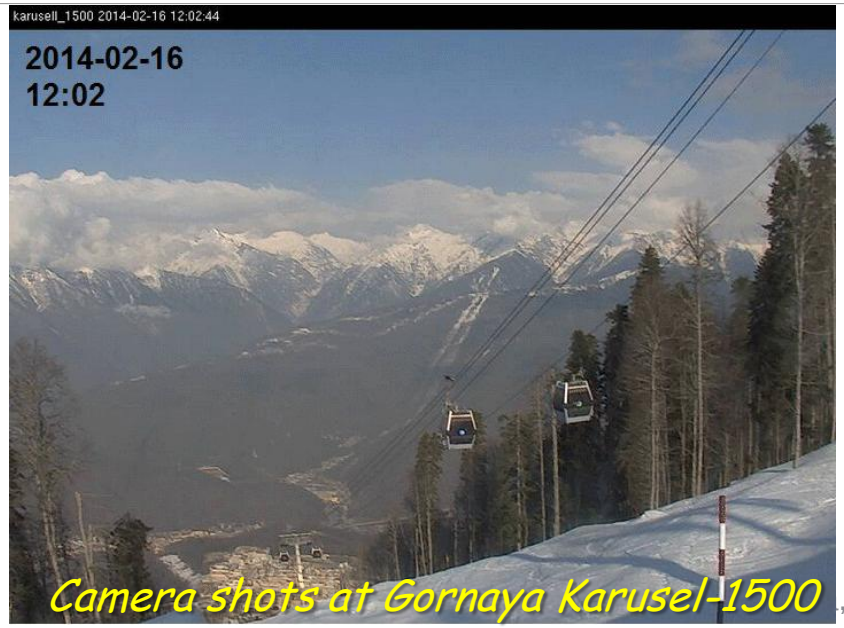
COSMO-Ru1

Domain: 110 km x 110 km
Grid: 100 x 100 x 50
Domain: 220 km x 220 km
Grid: 200 x 200 x 50
Domain: 495 km x 495 km
Grid: 450 x 450 x 50

Low visibility on February, 16-17, 2014

Biathlon Stadium (h=1455 m, highland)





Camera shots at Gornaya Karusel-1500

On February, 16-17 there were favorable conditions for the fog (cloudiness) formation and its conservation for a long period of time (the presence of snow cover, -5°C < T2m < +5 °C, wind speed < 1m/s).

At an altitude of 1000 -1500 m low visibility was observed from 14-15 UTC (17-18 h local time) on February, 16 till 12-13 UTC (15-16 h local time) on February, 17.

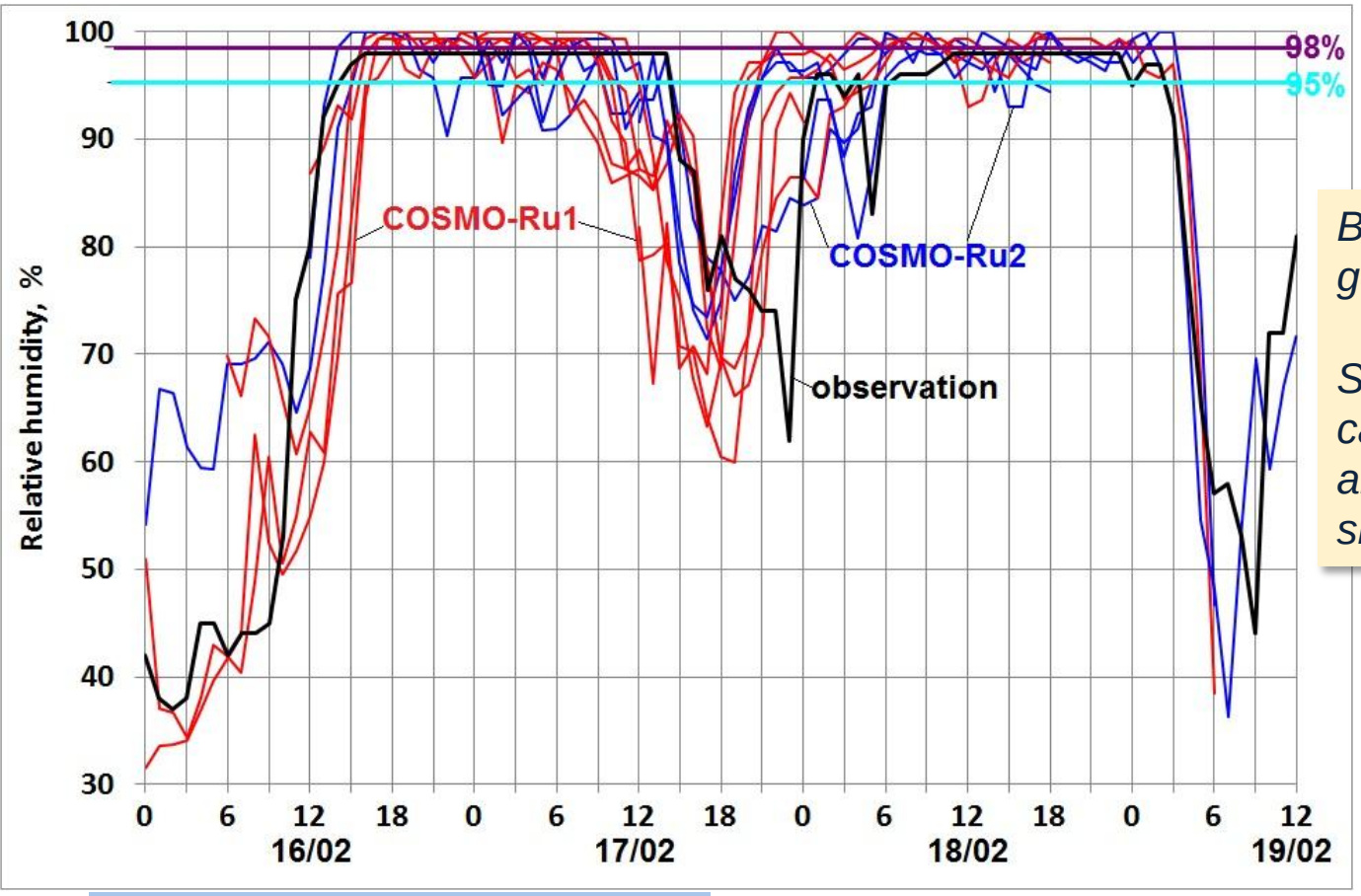
Observed ***minimum*** visibility values were:

- **25 m** (G.Carusel 1500),
- **29 m** (Biathlon Stdadium),
- **44 m** (Roza Khutor 4),
- **59 m** (G.Carusel 1000).

Subsequent ***decrease of the relative humidity*** and an increase in wind led to the dissipation of the fog (cloudiness).

Low visibility on February, 16-17, 2014

Relative humidity observation, COSMO-Ru1 and COSMP-Ru2 forecasts for Biathlon



Both models gave rather good results.

Some discrepancies can be caused by the difference in altitude between observation site and model grid node.

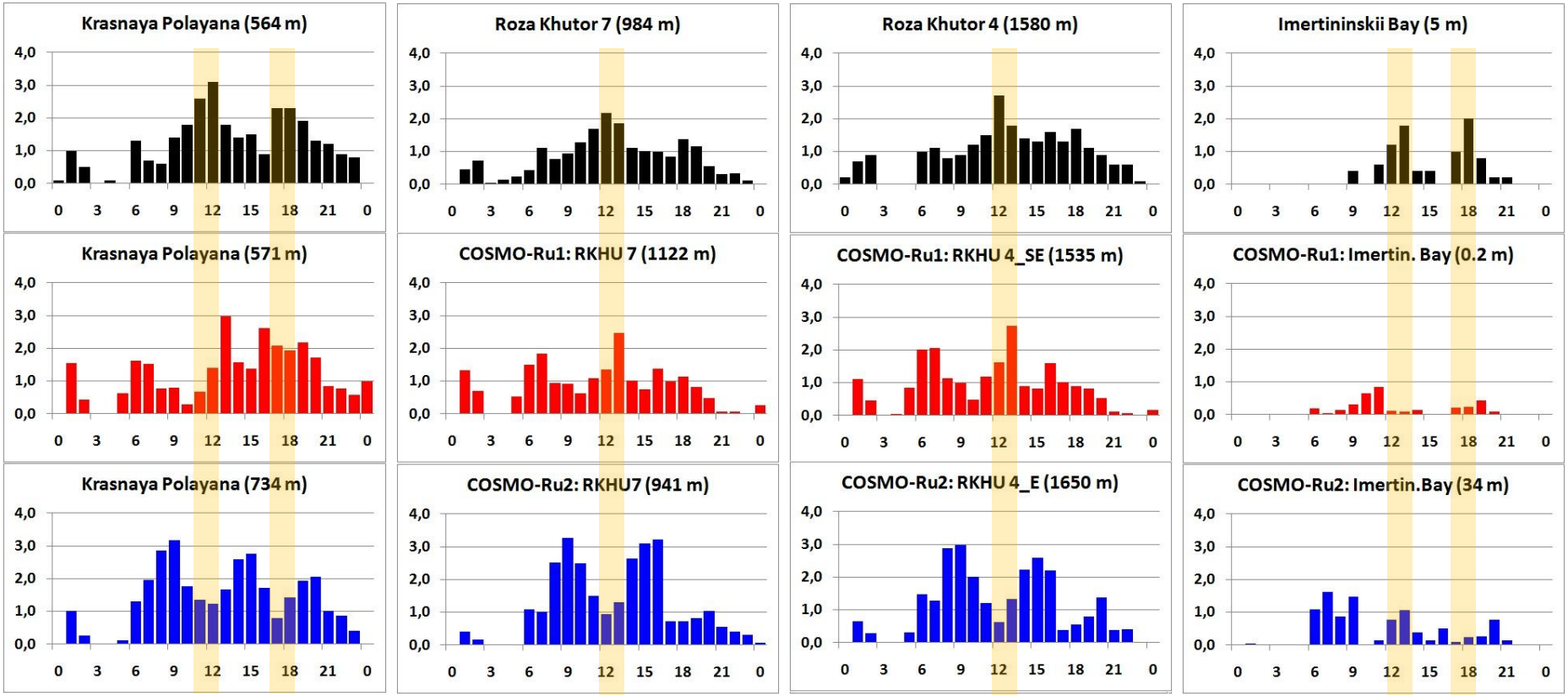
COSMO-Ru2 42 h forecasts from:
- 16/02, 00, 12 UTC;
- 17/02, 00, 12 UTC;
- 18/02, 00 UTC

COSMO-Ru1 36 h forecasts from:
- 15/02, 18 UTC
- 16/02, 00, 06, 12, 18 UTC;
- 17/02, 00, 06, 12, 18 UTC;

Cold front & low visibility on February, 18, 2014

Precipitation rate (mm/h). Observation, COSMO-Ru1 and COSMO-Ru2 forecasts

Bottom of the valley | *Slope of the valley* | *Coastal cluster*



Total precipitation, mean and maximum precipitation rate (mm/h)

Observations	29.5	1.2	3.1
COSMO-Ru1	29.3	1.2	3.0
COSMO-Ru2	32.3	1.3	3.2

Observations	19.7	0.8	2.2
COSMO-Ru1	20.3	0.9	2.7
COSMO-Ru2	28.3	1.1	3.3

Observations	23.4	0.9	2.7
COSMO-Ru1	21.6	0.9	2.7
COSMO-Ru2	26.0	1.0	3.0

Observations	9.0	0.4	2.0
COSMO-Ru1	3.5	0.1	0.9
COSMO-Ru2	9.7	0.4	1.6

Subtask 2

Development of algorithm of subgrid "h-correction" of T2m (due to the differences between model's and real heights) based on COSMO- forecasts of vertical T-gradient

Goal

- To realize the updated software of Fieldextra with including of calculations of subgrid values of T2m based the forecasts of vertical T gradient.
- To provide the software of 1-D correction of T2m forecasts based the forecasts of vertical T gradient ("h-correction").

Participants		**Resourse 0.25**
Greece	(E.Avgoustoglou)	0.05
MeteoSwiss	(J-M.Bettems)	0.10
Russia	(I.Rozinkina, D.Blinov)	0.10

Subtask 3

Preparing of archives of 7 km and 2.2 km EPSs forecasts for the Sochi-2014 modelling area applicable for research aimed at improving COSMO EPS systems and available for community

Goal

To prepare an archive of COSMO ensemble forecasts (with 7 and 2.2 km resolutions) for the Sochi area accompanied by initial and boundary conditions for high-resolution ensembles and by a list of important weather events during the period considered. The archive must be provided according to TIGGE-LAM archiving standards, easily accessible and have a clear manual to provide COSMO-community a possibility of experiments over an area where steep mountains are in close vicinity to the sea and high-resolution forecasts of severe events are a real challenge.

Participants **Resourse 0.25**

Russia (E.Astachova, D.Alferov, A.Bundel, A.Revokatova)	0.20
ARPA-SIMC (A.Montani)	0.05

Subtask 4

Preparing of recommendations for forecasters "The features of using and interpretation of the results of deterministic and ensemble mesoscale modelling"

Goal

To prepare the recommendations for forecasters to formulate and disseminate the experience of fead-back and trainings of period before and during the Sochi-2014 concerning the features of interpretation of mesoscale deterministic and ensemble NWP Systems

Participants	Resourse
Russia (I.Rozinkina)	0.15
MeteoSwiss (P.Eckert)	0.05