

WG5 Activities – Overview of verification highlights

Flora Gofa

WG5

WG5

Work Group Task list was updated during the WG5-VERSUS meeting that took place in Rome, April 2012.

Annual tasks and FTEs assignments

Rows: 0 added; 1 removed | Cells: 6 changed; 1 open | last: closing

SET EDIT OFF

Name	Mainly relates to	Target version	Task subject	Responsible person	Task status	Stared	Expected delivery	Secondary association
all notes all status								
1 Verification of surface weather parameters								
1.1	COSMO	N/A	Verification of COSMO models surface weather elements with SYNOP stations	ALL	evaluate	N/A	2012-08-31	N/A
notes status								
Verification of surface weather elements in various time steps at SYNOP stations. and higher are available, for Mlsp, T2m, Td2m, 10m-wind, cloud cover, precipitation (mandatory). Wind gust and radiation verification is ongoing. New techniques for proper wind direction discrepancies representation.								
1.2	COSMO	N/A	Conditional Verification (CV)	ALL	evaluate	N/A	2012-08-31	N/A
notes status								
Following the indications coming out from the joint WG5-WG3-WG4 workshop held in Langen in February 2011 and the document reporting a common set of Conditional Verification, this task has the aim to increase the production and the use of CV, together with the standard ones. CV will have to be carried out through VERSUS. Reviewed document of recommendations and priorities for preparation of plots and is available online. Mandatory CV verification of selected cases is included in Common Plots seasonal report.								
1.3	COSMO	N/A	Responsibility for Common Plots Reports	USAM: A. Celozzi, A. Raspanti	evaluate	N/A	2012-08-31	N/A
notes status								
Quarterly scores produced through VERSUS have to be sent to the responsible member that will prepare and give a presentation during the GM WG5 Parallel Sessions. A choice of more significant plots and a summary of highlights are included in seasonal reports and are available on COSMO web site.								
Decision to rotate the responsibility to all members on annual basis								
1.4	COSMO	N/A	Dissemination of Daily Grib Model Output Files	MCH: De Morsier	evaluate	N/A	2012-08-31	N/A
notes status								
Exchange of Grib files to produce COSMO models maps at the COSMO WEB site. GRIB files of the 24h precipitation sums from +6h to +30h and the surface pressure (pmsl) at +24h of the operational 00 UTC forecasts from COSMO-EU (DWD), COSMO-7 (MeteoSwiss), COSMO-ME (USAM), COSMO-I7 (ARPA-EMR), COSMO-PL (IMGW), COSMOGR (HNMS) and COSMO_RO (NMA) are sent daily to the COSMO web site for <u>verification and comparison purposes</u> . RHM is currently not participating.								

2 Verification of vertical profiles

2.1	COSMO	N/A	Verification of the vertical profiles using TEMP observations, with aircraft data (AMDAR) and with windprofiler data where applicable	ALL	evaluate	N/A	2012-08-31	N/A	notes	status
-----	-------	-----	---	-----	----------	-----	------------	-----	-------	--------

Verification of traditional upper air parameters (wind speed, temp, geop, RH) using TEMP stations and when available other upper air data (windprofilers, amdars), keeping a distinction between different kind of observations in verification. This will be accomplished through the use of Feedback Files after the implementation in the future releases of VERSUS, by the end of 2012.

3 High density verification and special aspects

3.1	COSMO	N/A	High density verification of precipitation over Italy	ARPA Piedmont: Oberto, Turco	evaluate	N/A	2012-08-31	N/A	notes	status
-----	-------	-----	---	------------------------------	----------	-----	------------	-----	-------	--------

3.2	COSMO	N/A	Exchange of a common data set of non-GTS data	DWD: Uli Damrath	evaluate	N/A	2012-08-31	N/A	notes	status
-----	-------	-----	---	------------------	----------	-----	------------	-----	-------	--------

Exchange of a common data set of non-GTS data inside COSMO (daily precipitation data from 6 UTC to 6 UTC). Collection of these non-GTS and adjusting them in a common format. Delivery once a month. These data will be used only within COSMO for verification purposes. Data are available at DWD by ftp. In the near future these data should be available on the COSMO web.

DWD sends the daily precipitation data to all interested partners (3363 stations in Germany, 445 in Switzerland, 418 in Italy and 308 in Poland) ≥ used at ARPA-EMR and ARPA-Piedmont. Contributing Scientists are Uli Damrath (DWD), in collaboration with MeteoSwiss (Control of data and gridding the data), RWS in Northern Italy. Data format should be BUFR pseudo-synop to be readable in VERSUS. For any other binary or ASCII format a dedicated Front-end should be implemented.

3.3	COSMO	N/A	Evaluation of COSMO models in the lower PBL.	N/A	evaluate	N/A	2012-08-31	N/A	notes	status
-----	-------	-----	--	-----	----------	-----	------------	-----	-------	--------

In the framework of SRNWP data Exchange project (JM.Betters) are now available a large set of data from selected station in Europe for some special parameters like radiation fluxes and soil moisture. It would be interesting and important to use this set of data to verify the PBL surface of our COSMO implementations.

Still no participation

3.4	COSMO	N/A	Long Term trend Verification	ALL	evaluate	N/A	2012-08-31	N/A	notes	status
-----	-------	-----	------------------------------	-----	----------	-----	------------	-----	-------	--------

Long term trend verification of various statistical indexes (COSI index, ETS, FBI, RMSE...) of COSMO models implementation when large period set of data are available to check general improvement of each COSMO implementation.

3.5	COSMO	N/A	Weather Dependant Verification (WDV)	ALL	evaluate	N/A	2012-08-31	N/A	notes	status
-----	-------	-----	--------------------------------------	-----	----------	-----	------------	-----	-------	--------

Once each member will have defined his own weather types classification, WDV can be produced through VERSUS system. This activity is crucial to assess dependences in model behavior from the synoptic situation. Classification can be automatic or subjective.

4 Verification based on remote sensing data - Neighborhood method techniques										
4.1	COSMO	N/A	Verification of COSMO-7 precipitation forecast using Radar composite network	MCH: Leuenberger	evaluate	N/A	2012-08-31	N/A	notes	status
A weather situation-dependent verification of COSMO-7 precipitation based on Swiss radar composite is performed with a simple objective classification based mainly on 500hPa winds and surface pressure distribution over the alpine region from IFS model. The results are available for 14 different situations on a yearly basis.										
4.2	COSMO	N/A	Precipitation verification using radar composite network with neighborhood methods	DWD: Uli Damrath, MCH:P.Kaufmann	evaluate	N/A	2012-08-31	N/A	notes	status
5 Verification of EPS products										
5.1	COSMO	N/A	Verification of EPS systems.	Cooperation with WG7	evaluate	N/A	2012-08-31	N/A	notes	status
Verification of surface weather parameters from Operational EPS systems based on COSMO models. Development of necessary modules in VERSUS software.										
6 Other										
6.1	COSMO	N/A	Annual Workshop/Tutorial on VERSUS2 & WG5	N/A	evaluate	N/A	2012-08-31	N/A	notes	status
VERSUS tutorial and WG5 workshop is organized on a yearly basis to promote verification activities and to resolve any issues connected with the capabilities of VERSUS system.										

WG5/VERSUS meeting, 2-4 April 2012, Rome

WG5 videoconference on proposed CV tests, 20 August 2012

Overview of verification results

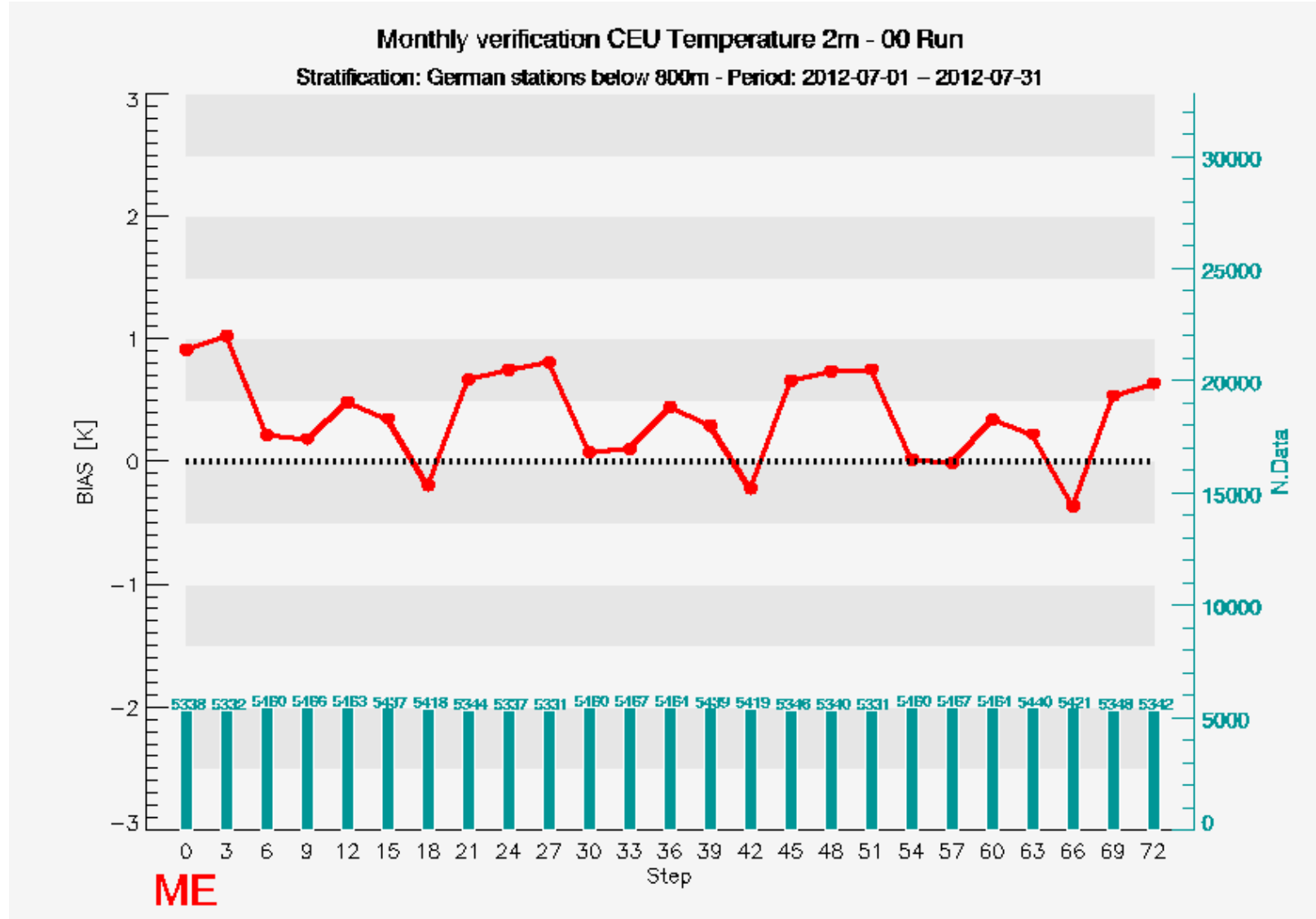
Authors: ALL

WCG5

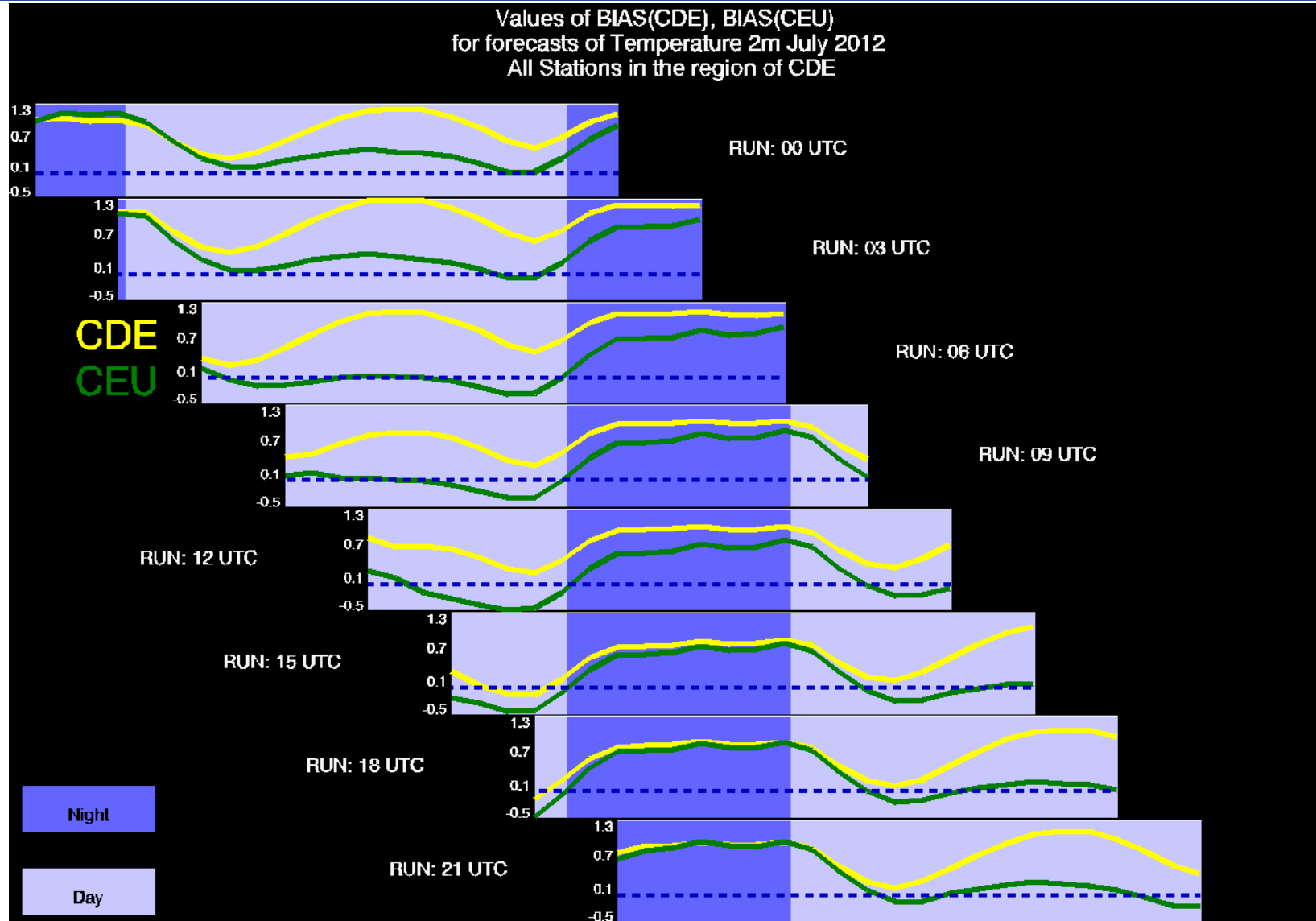
Verification of COSMO model SFC weather parameters (Task 1.1)

WCG5

CEU: Temperature 2m, July 2012



CEU + CDE: Temperature 2m, July 2012, Bias





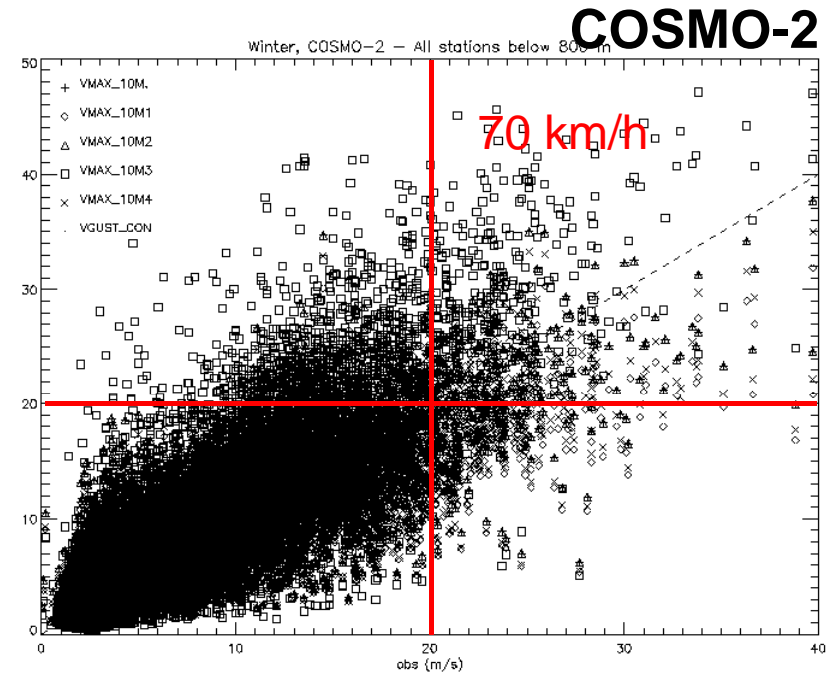
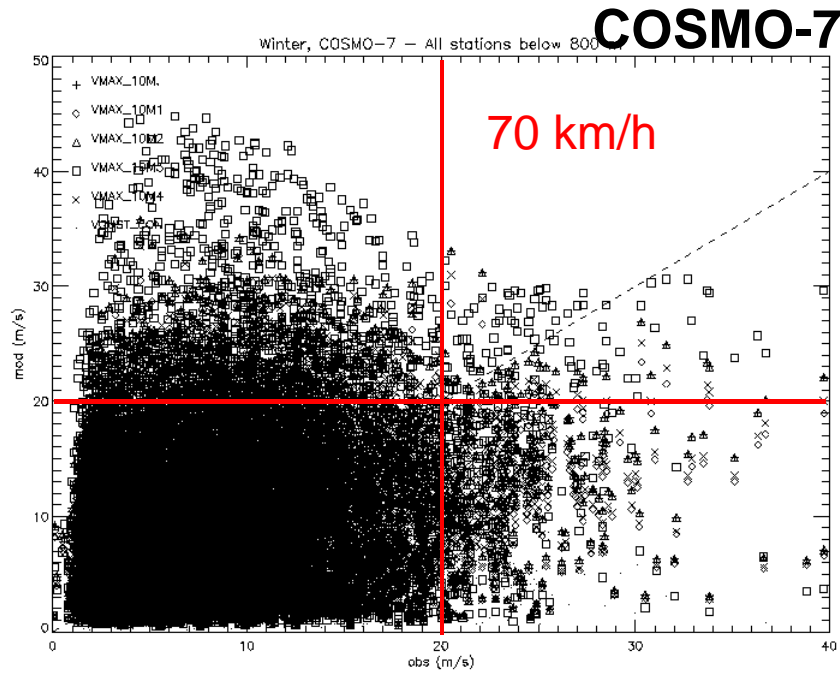
Diagnostic calculation of gusts

(A) turbulent part

- based on wind@30m
opr COSMO-7 and COSMO-2 -> namings -2, -7
- based on wind@10m
opr COSMO-EU namings -EU
- based on wind@10m + tuning parameter with wind10m
opr COSMO-DE namings -DE
- physically based (TKE in PBL) after Brasseur
nowhere opr namings BRA



wind gust (all 4 parametrizations) 03.12.11 – 06.01.12

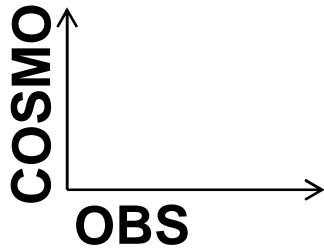
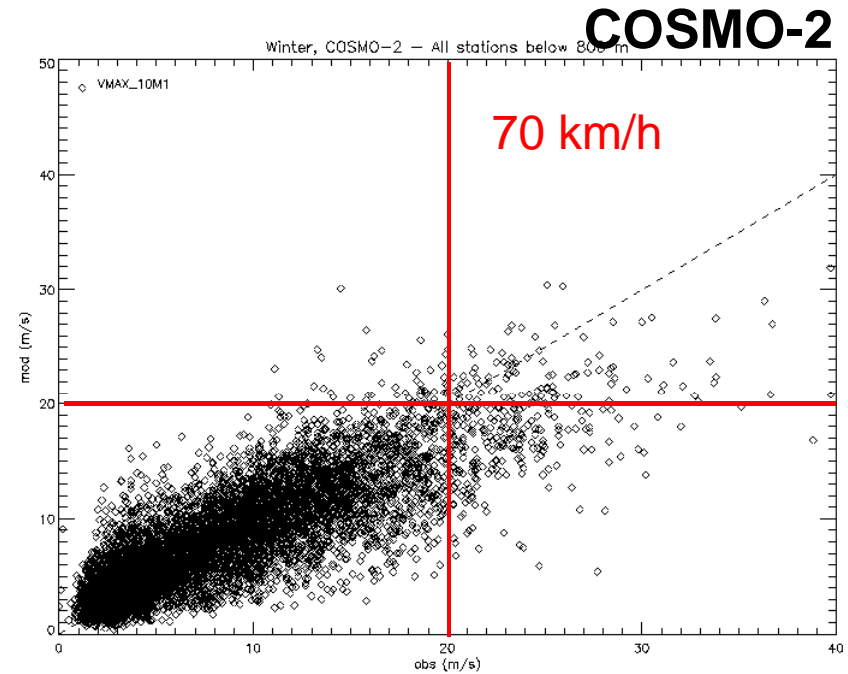
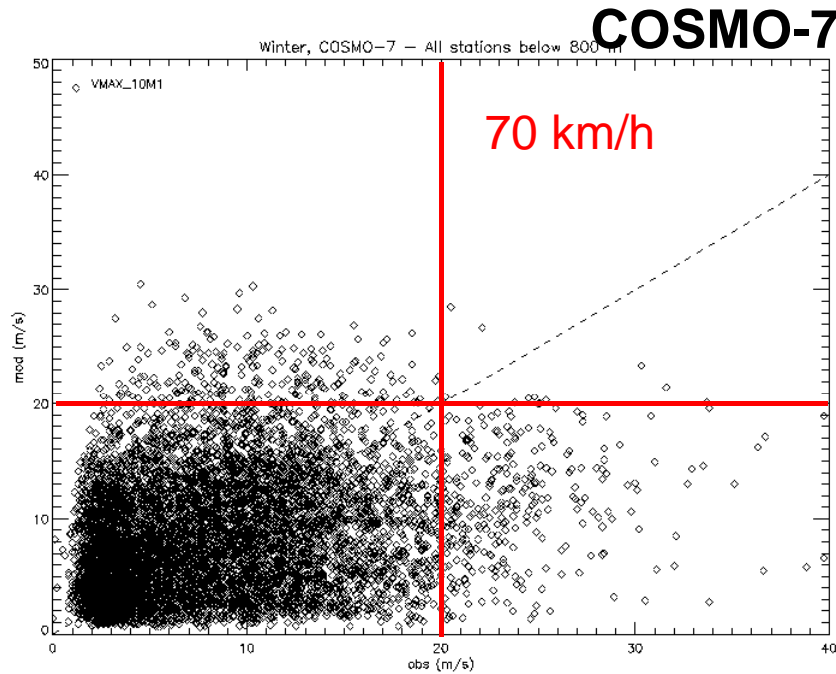


COSMO ↑
→ **OBS**

Scatter plot for obs with
all swiss stations < 800m



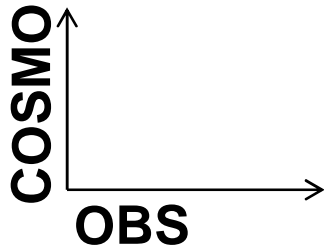
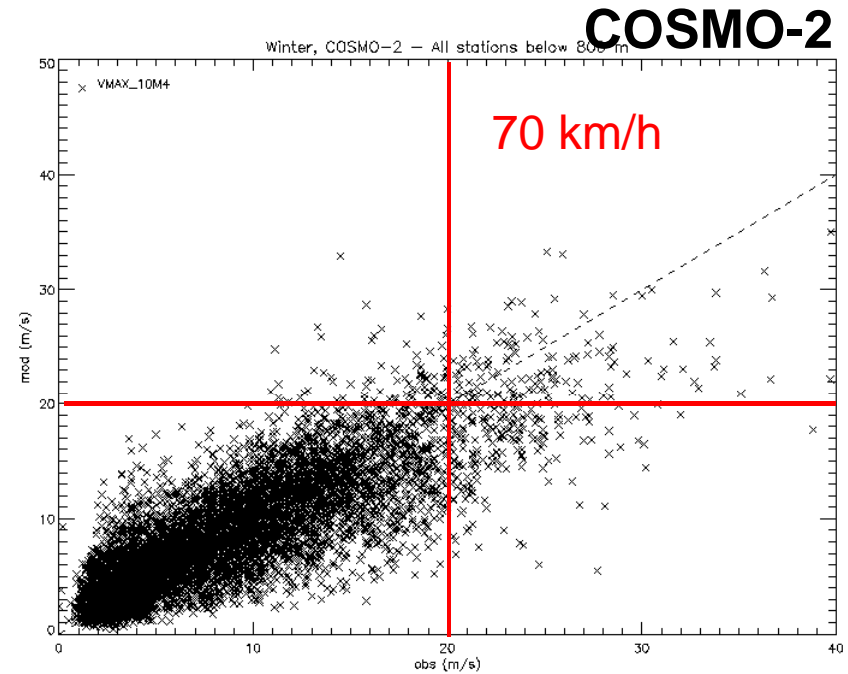
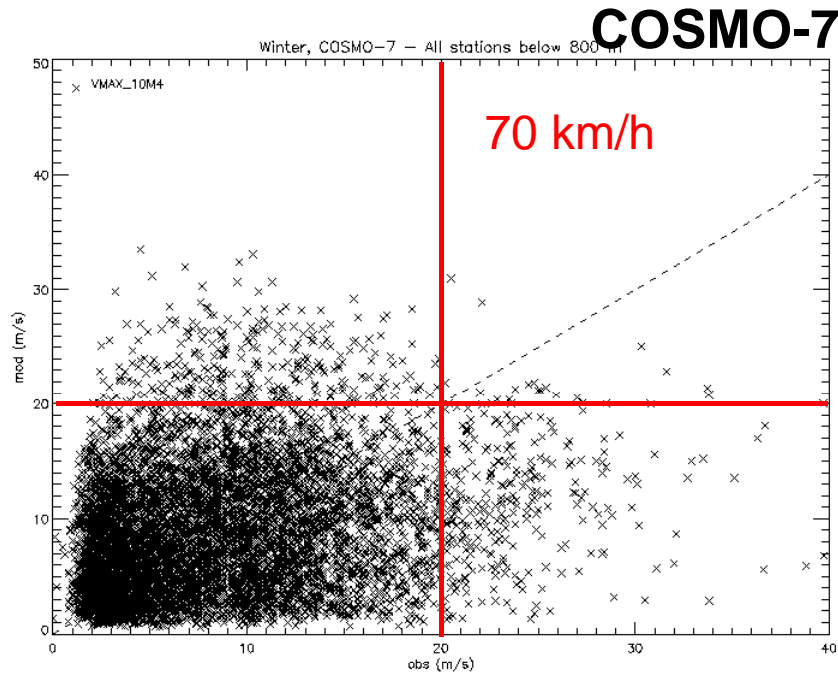
wind gust after – operational COSMO-EU 03.12.11 – 06.01.12



Scatter plot for obs with
all swiss stations < 800m



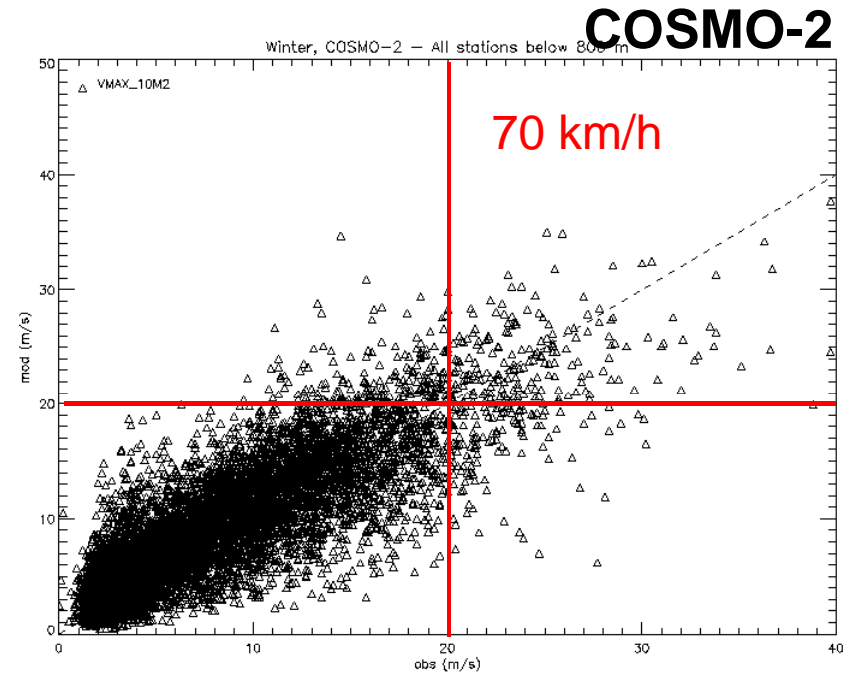
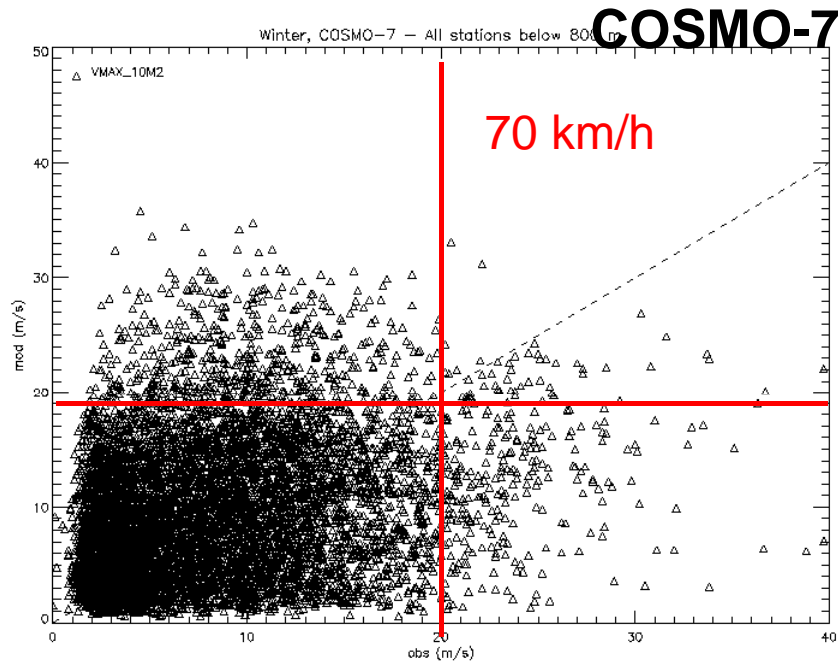
wind gust after – operational COSMO-DE 03.12.11 – 06.01.12



Scatter plot for obs with
all swiss stations < 800m



wind gust after –operational COSMO-7 and -2 03.12.11 – 06.01.12

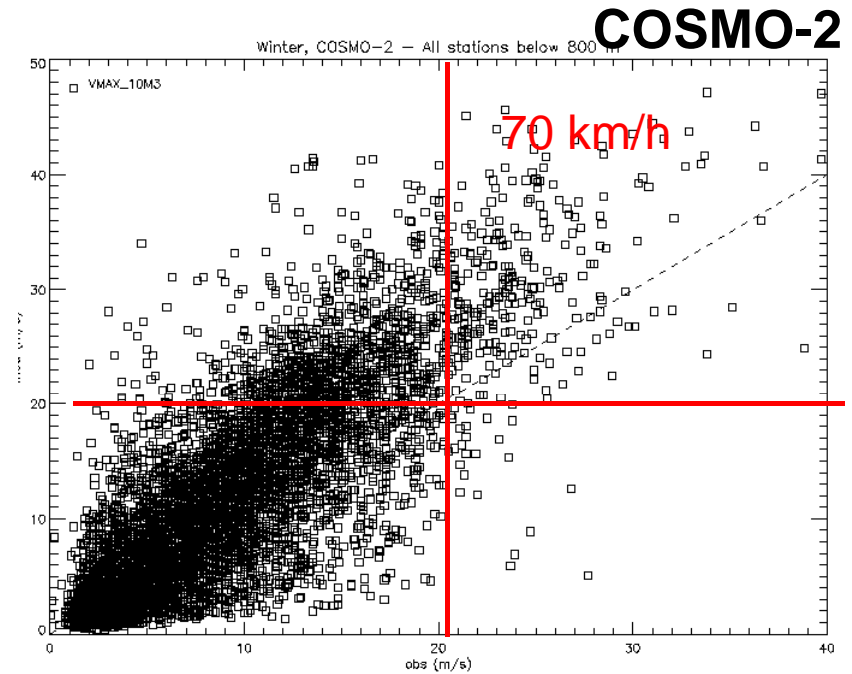
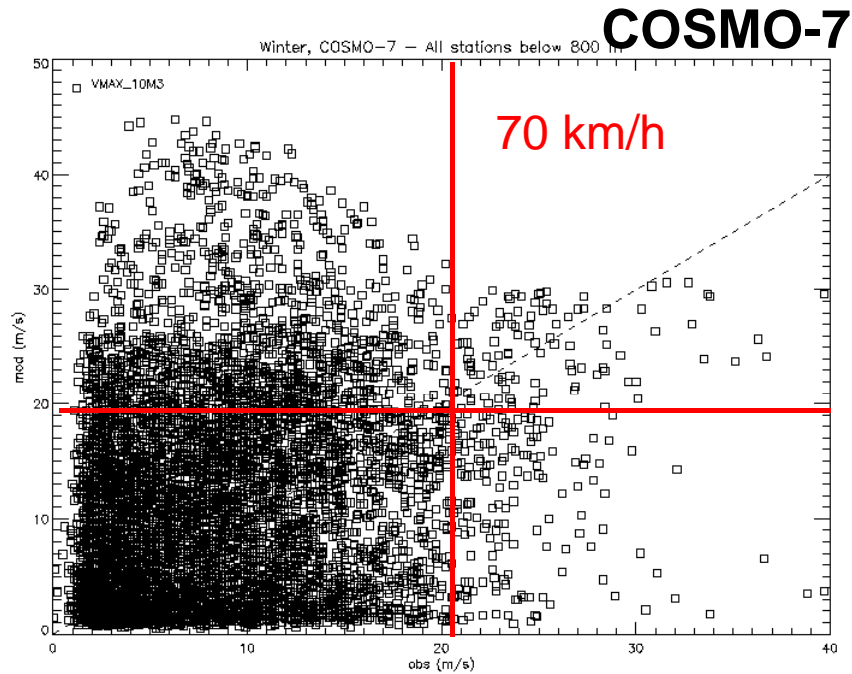


COSMO ↑
→ **OBS**

Scatter plot for obs with
all swiss stations < 800m



Wind gust after – Brasseur (TKE in PBL) 03.12.11 – 06.01.12



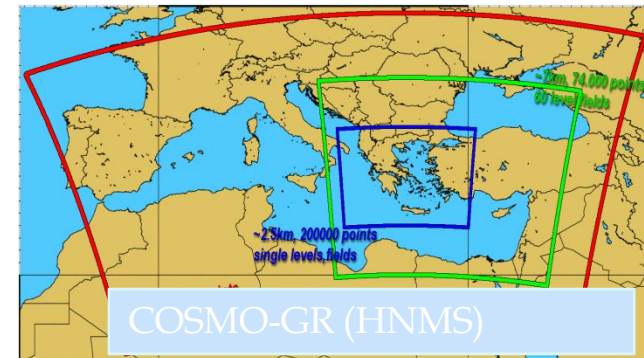
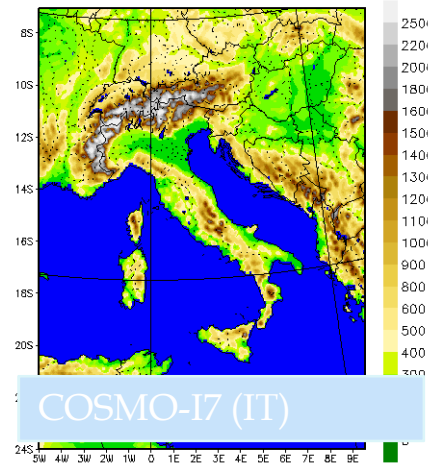
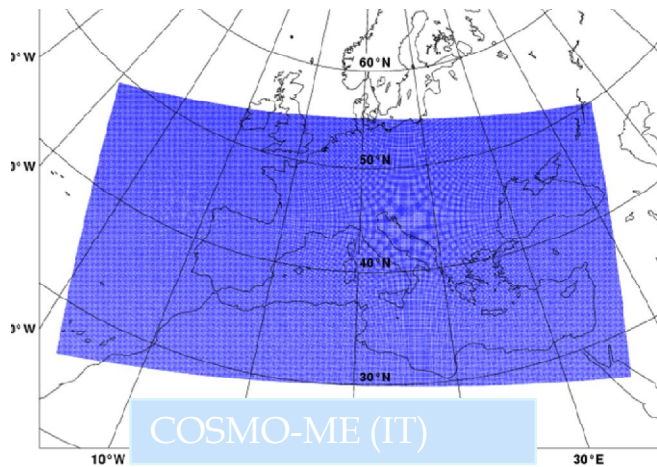
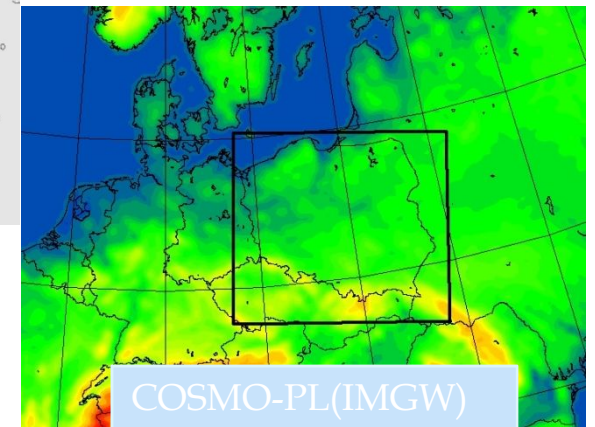
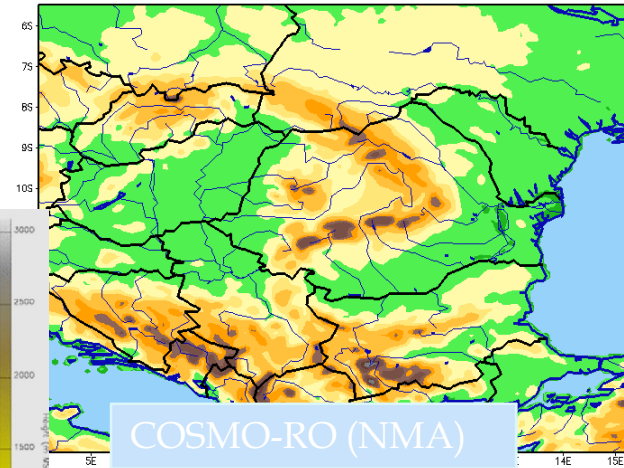
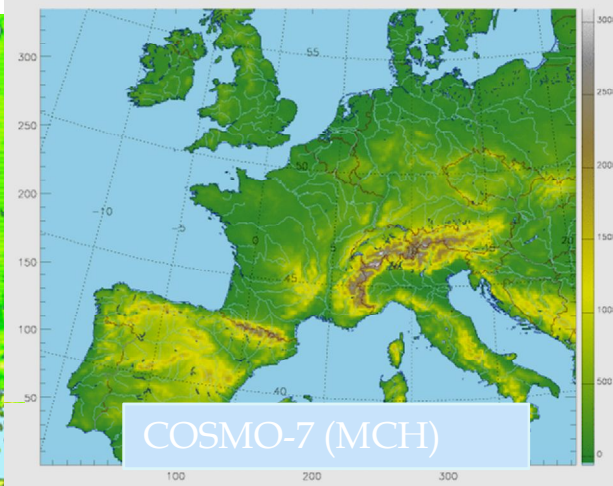
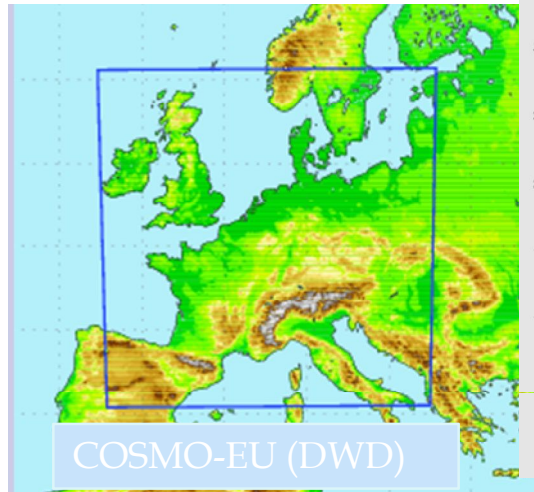
COSMO
↑
OBS →

Scatter plot for obs with
all swiss stations < 800m

Common Plots (Task 1.3)

WG5

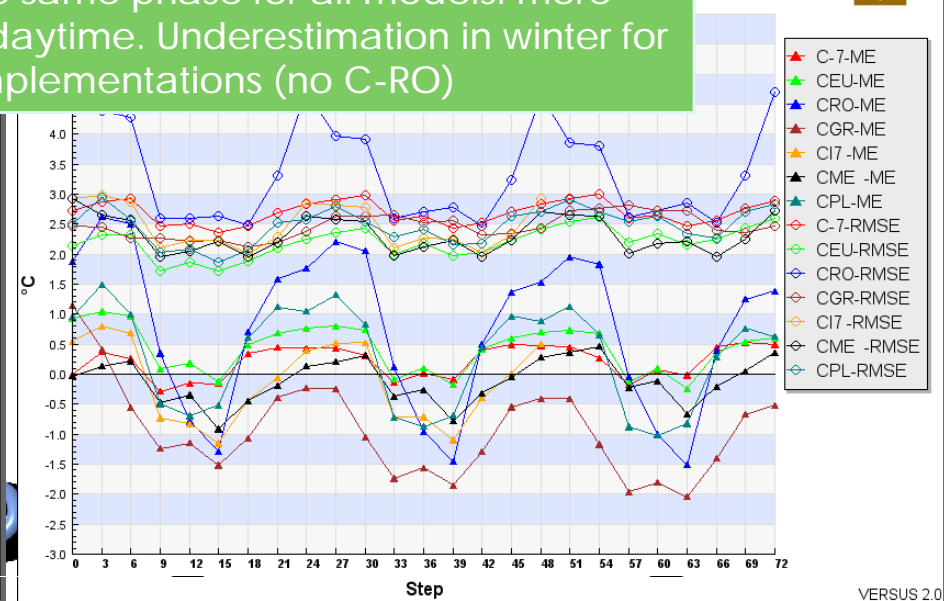
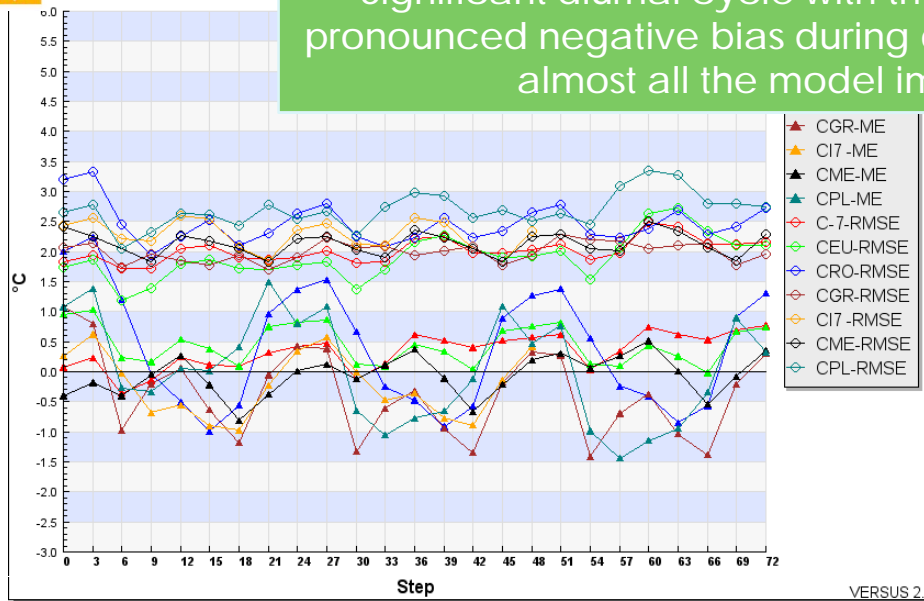
THE MODELS



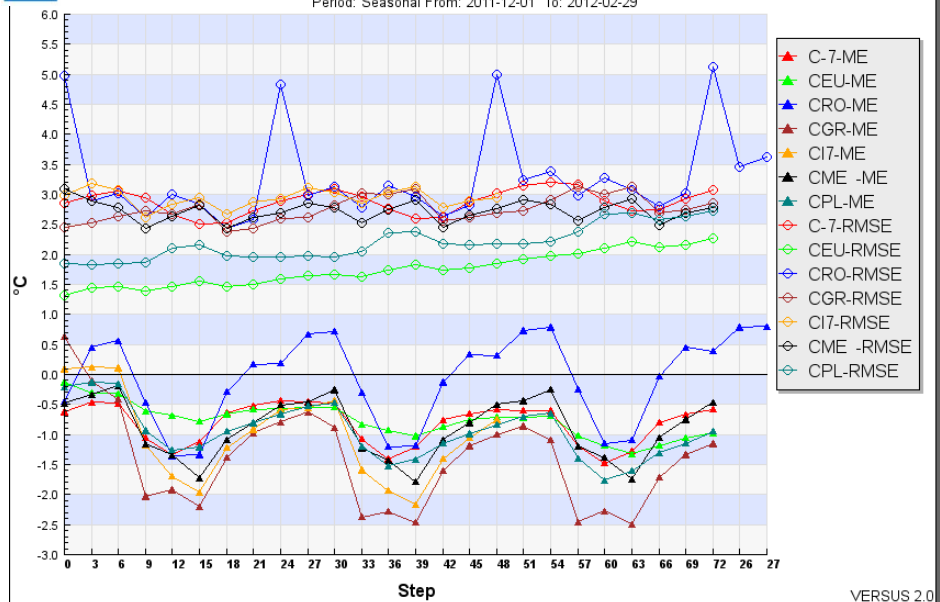
TEMPERATURE AT 2 M - JJA 2011 – MAM 2012



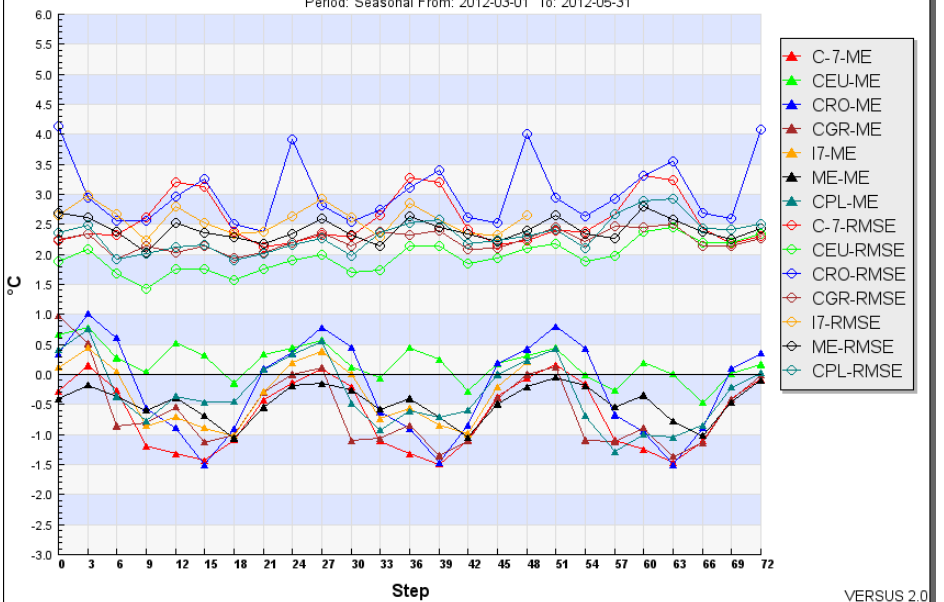
Significant diurnal cycle with the same phase for all models: more pronounced negative bias during daytime. Underestimation in winter for almost all the model implementations (no C-RO)



Cross-Model: Temperature 2m
Period: Seasonal From: 2011-12-01 To: 2012-02-29



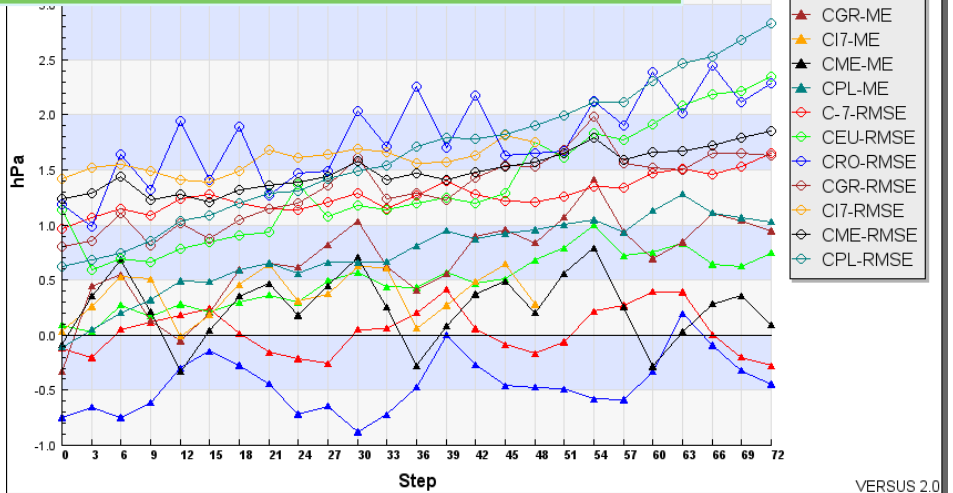
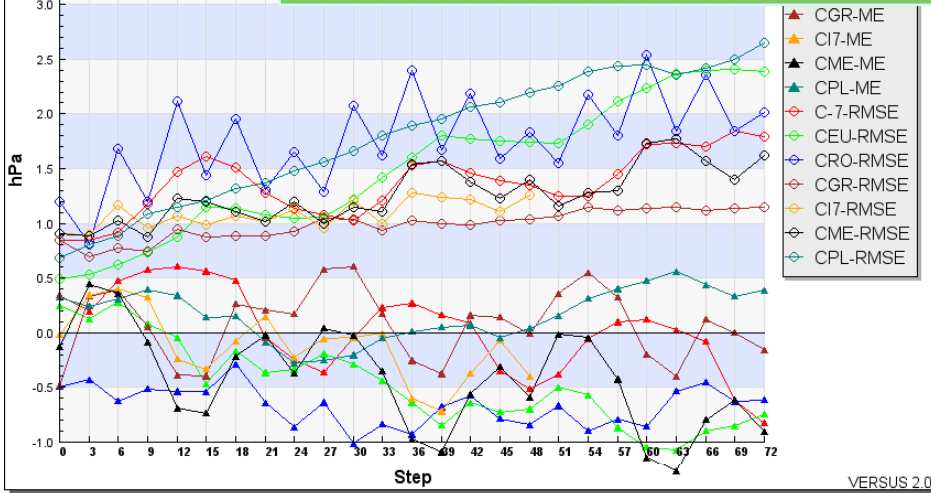
Cross-Model: Temperature 2m
Period: Seasonal From: 2012-03-01 To: 2012-05-31



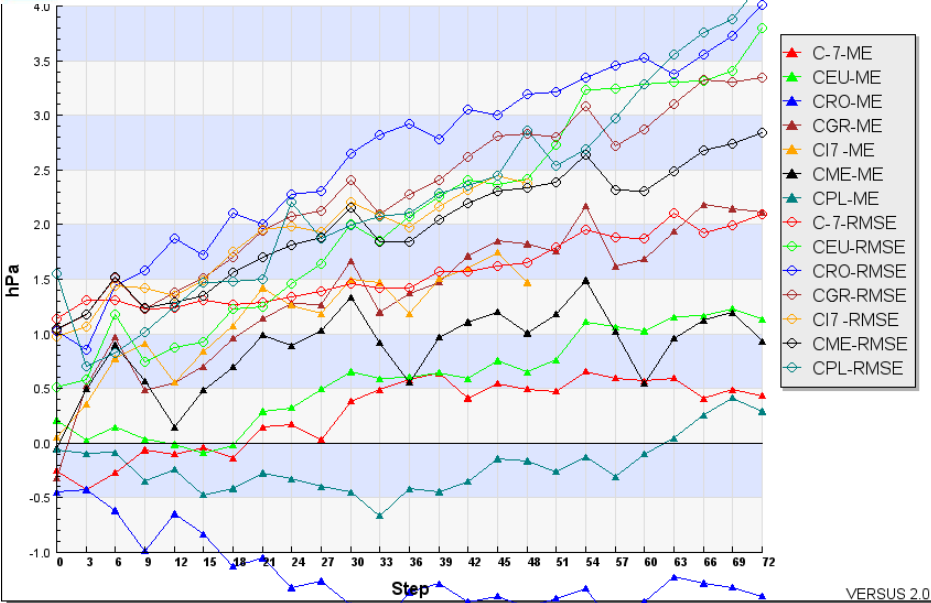
MEAN SEA LEVEL PRESSURE - JJA 2011 – MAM 2012



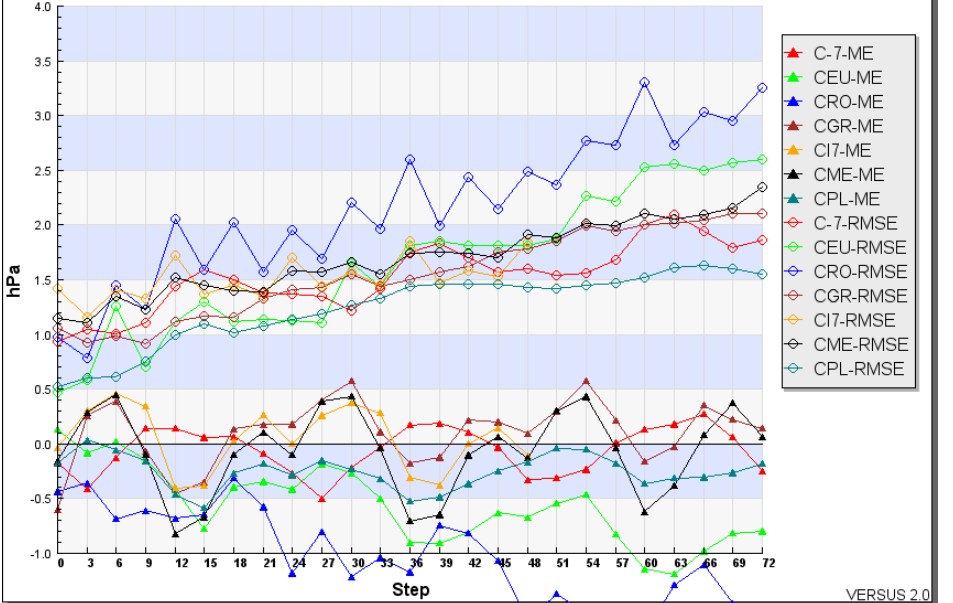
The behaviour of the models is different depending on the season. Peculiar C-RO always underestimates mainly DJF and MAM when also C-EU and C-PL underestimate. RMSE growing with fc ranges.



Cross-Model: Mean Sea Level Pressure
Period: Seasonal From: 2011-12-01 To: 2012-02-29



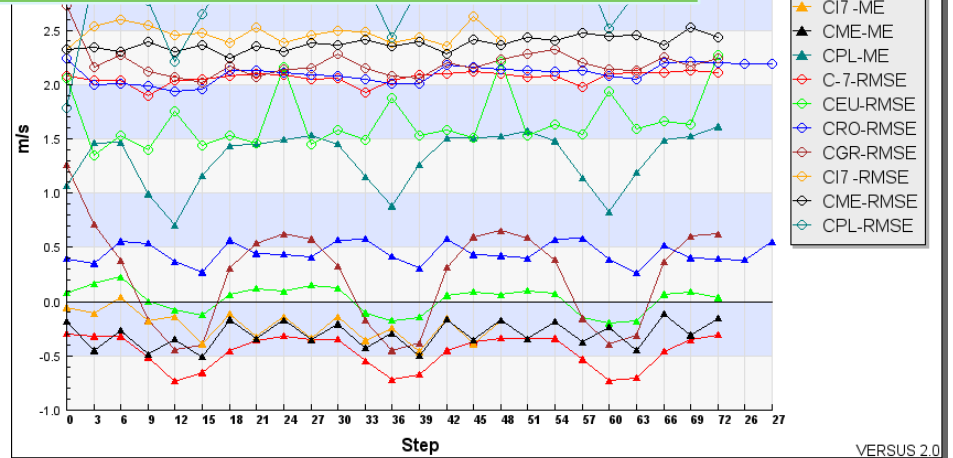
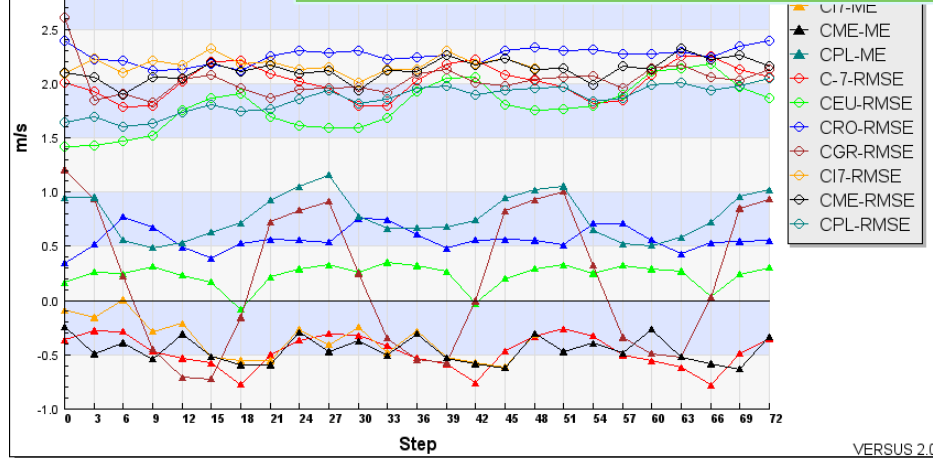
Cross-Model: Mean Sea Level Pressure
Period: Seasonal From: 2012-03-01 To: 2012-05-31



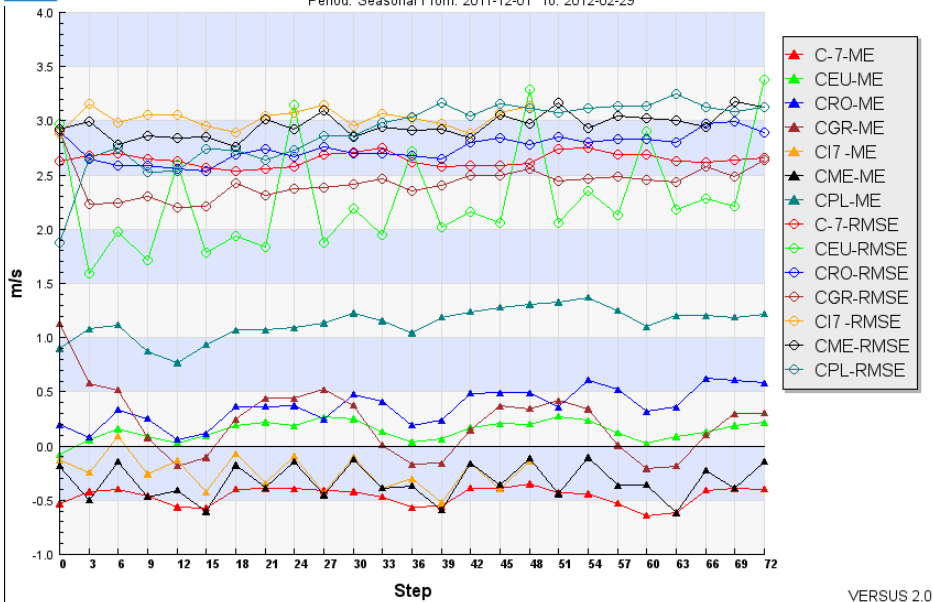
WIND SPEED AT 10 M - JJA 2011 – MAM 2012



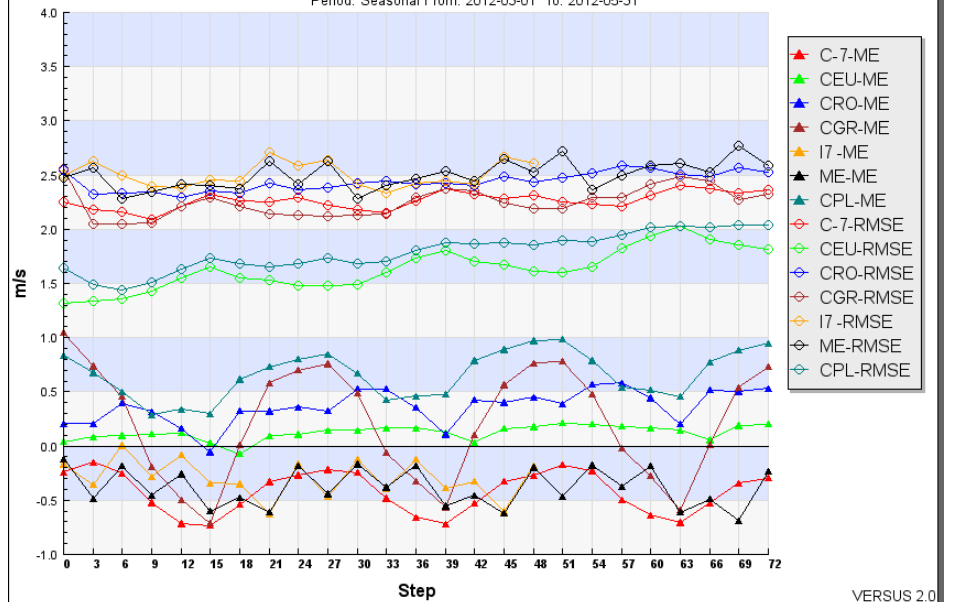
C-GR shows always bias around 0, while the others separate in 2 groups IFS driven and GME driven, but also with less complex orography. Always very high the overestimation of C-PL. In RMSE peculiar behaviour for C-EU that has lower values.



Cross-Model: 10m wind speed
Period: Seasonal From: 2011-12-01 To: 2012-02-29



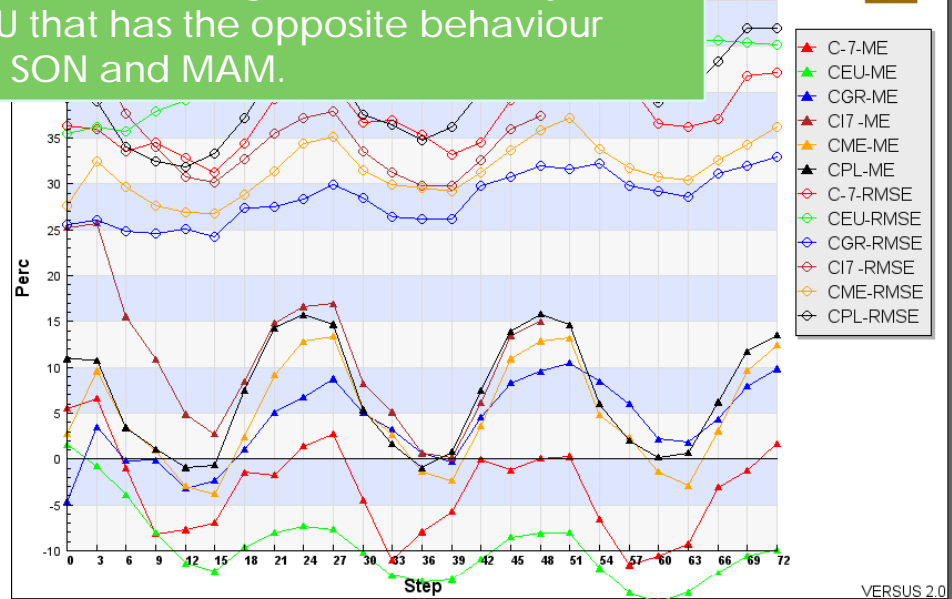
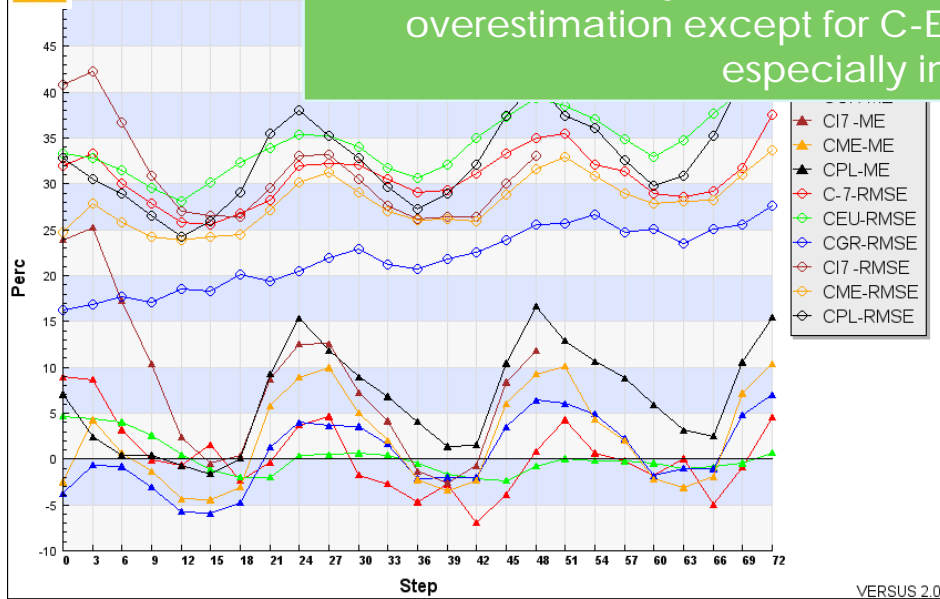
Cross-Model: 10m wind speed
Period: Seasonal From: 2012-03-01 To: 2012-05-31



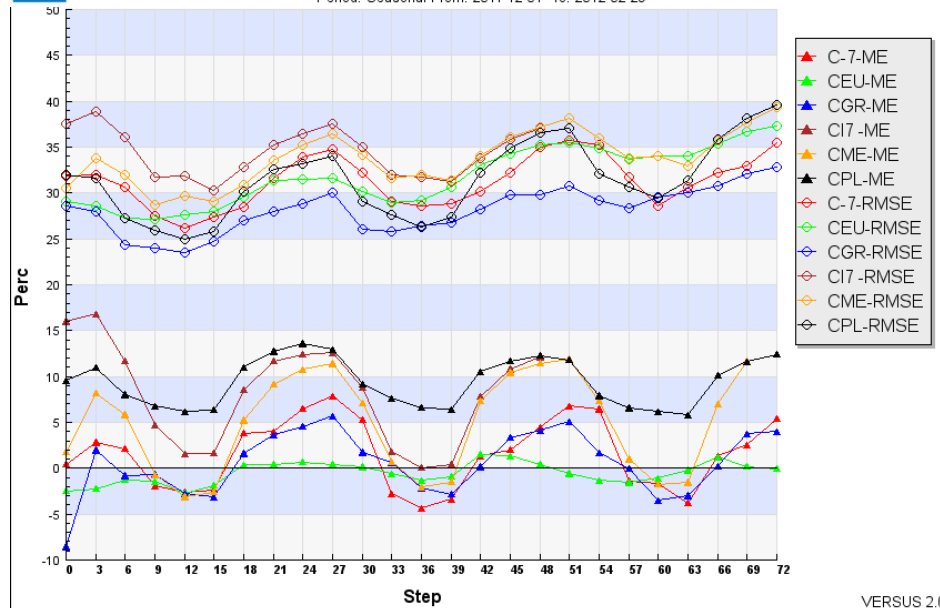
TOTAL CLOUD COVER - JJA 2011 – MAM 2012



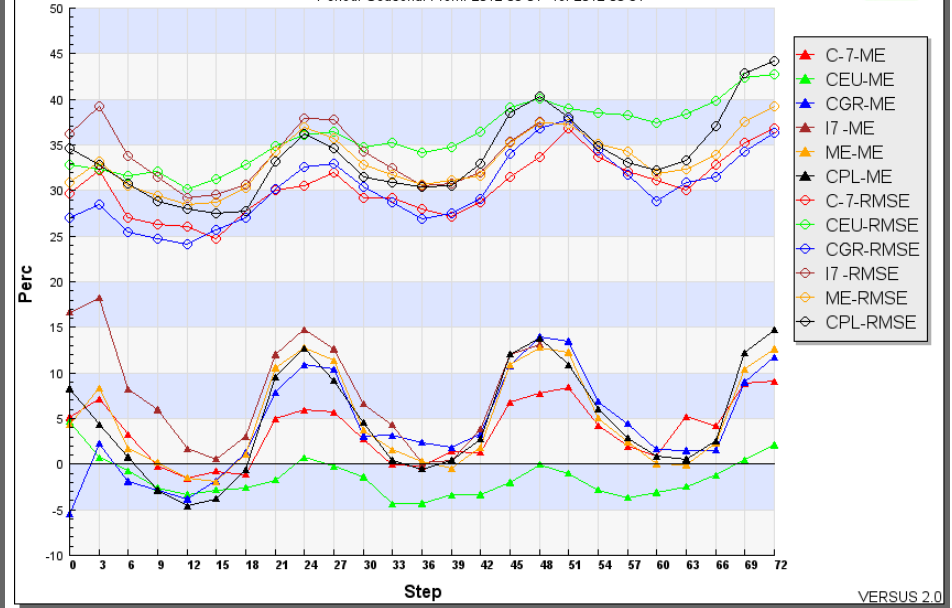
Clear diurnal cycle for all the models with a general tendency to overestimation except for C-EU that has the opposite behaviour especially in SON and MAM.



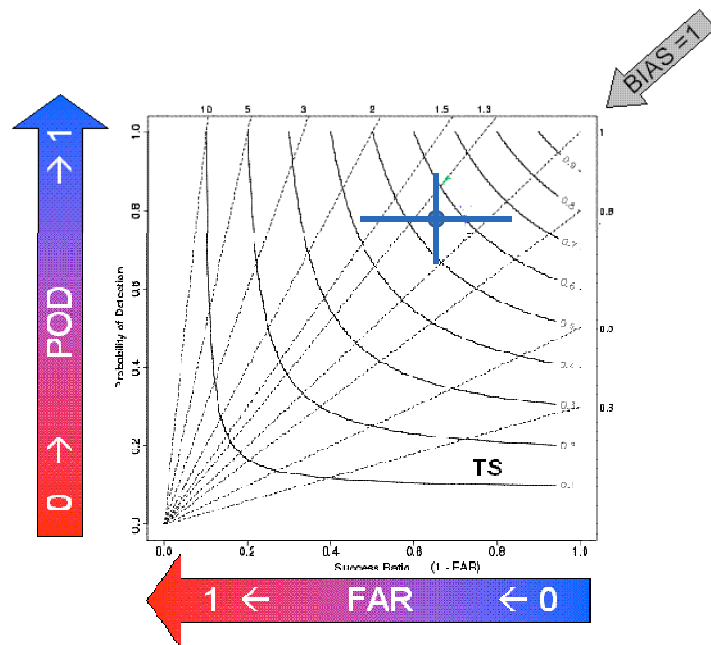
Cross-Model: Total CC
Period: Seasonal From: 2011-12-01 To: 2012-02-29



Cross-Model: Total CC
Period: Seasonal From: 2012-03-01 To: 2012-05-31



PERFORMANCE DIAGRAM

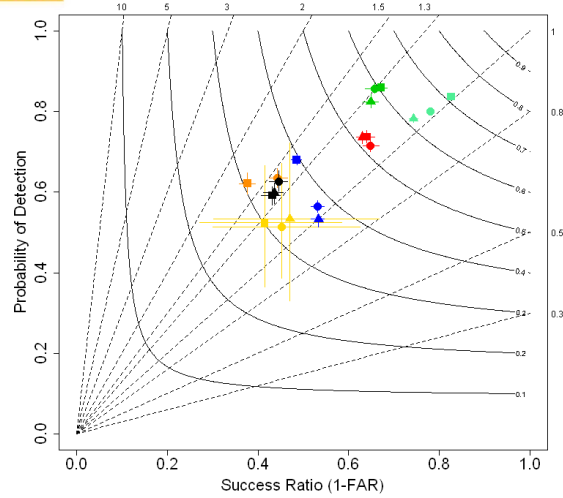


- In the graph is exploited the geometric relationship between four measures of dichotomous forecast performance:
 - probability of detection (POD)
 - success ratio (SR, defined as 1-FAR)
 - bias score (BS)
 - threat score (TS, also known as the Critical Success Index).
- For good forecasts, POD, SR, bias and TS approach unity, such that a perfect forecast lies in the upper right of the diagram.
- The cross-hairs about the verification point represent the influence of the sampling variability.
 - They are estimated using a form of resampling with replacement bootstrapping from the verification data (from the contingency table).
 - The bars represent the 95th percentile range for SR and POD.

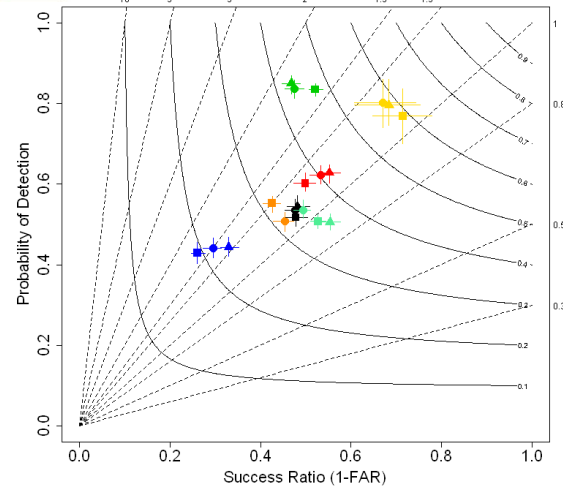




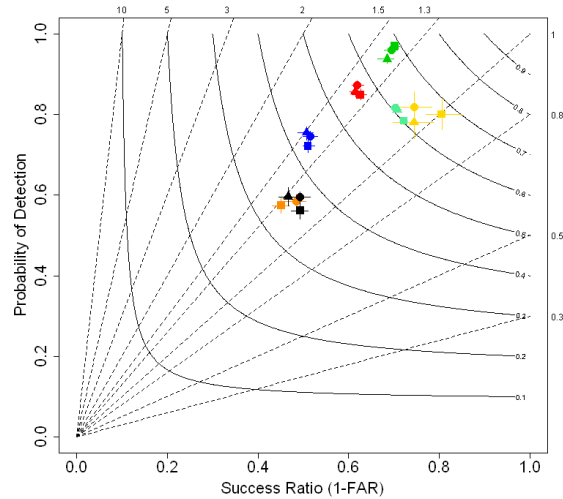
JJA2011: Precipitation in 24h - 0.2mm threshold



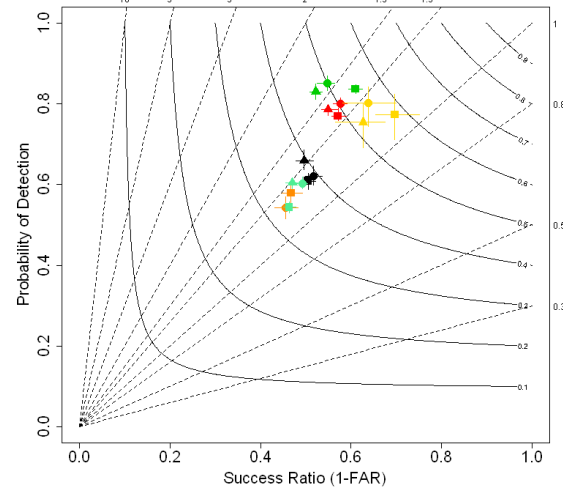
SON2011: Precipitation in 24h - 0.2mm threshold



DJF2011-2012: Precipitation in 24h - 0.2mm threshold



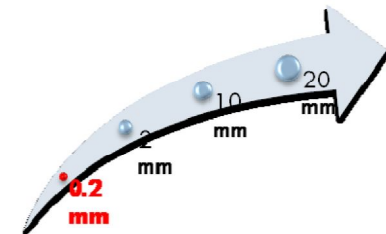
MAM2012: Precipitation in 24h - 0.2mm threshold



- COSMO-7 + 24
- COSMO-7 + 48
- ▲ COSMO-7 + 72
- COSMO-GR + 24
- COSMO-GR + 48
- ▲ COSMO-GR + 72
- COSMO-I7 + 24
- COSMO-I7 + 48
- ▲ COSMO-I7 + 72
- COSMO-ME + 24
- COSMO-ME + 48
- ▲ COSMO-ME + 72
- COSMO-PL + 24
- COSMO-PL + 48
- ▲ COSMO-PL + 72
- COSMO-EU + 24
- COSMO-EU + 48
- ▲ COSMO-EU + 72
- COSMO-RO + 24
- COSMO-RO + 48
- ▲ COSMO-RO + 72



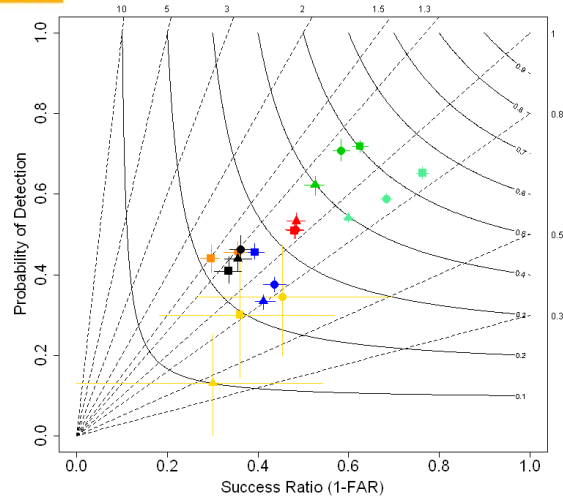
Overestimation for most of the models, in particular MAM2012.



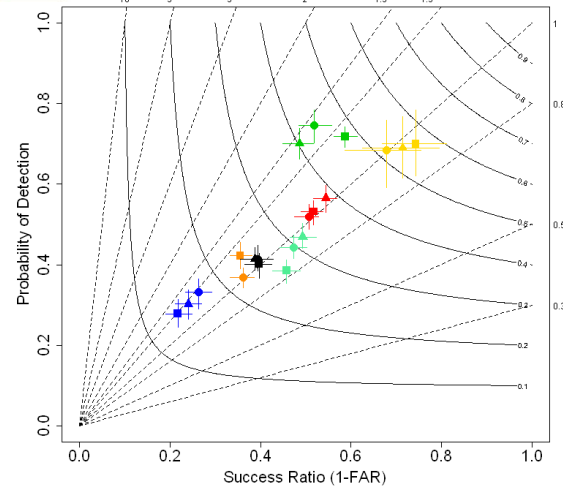
THRESHOLD



JJA2011: Precipitation in 24h - 2mm threshold



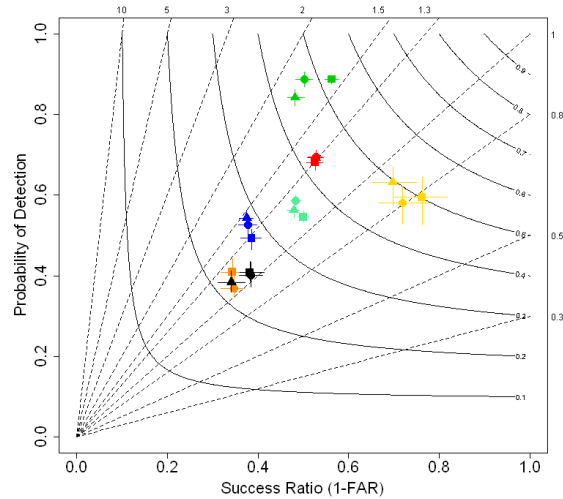
SON2011: Precipitation in 24h - 2mm threshold



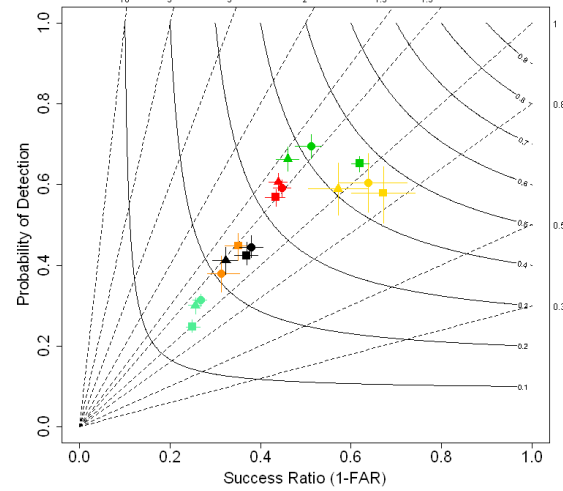
- COSMO-7 + 24
- COSMO-7 + 48
- ▲ COSMO-7 + 72
- COSMO-GR + 24
- COSMO-GR + 48
- ▲ COSMO-GR + 72
- COSMO-I7 + 24
- COSMO-I7 + 48
- COSMO-ME + 24
- COSMO-ME + 48
- ▲ COSMO-ME + 72
- COSMO-PL + 24
- COSMO-PL + 48
- ▲ COSMO-PL + 72
- COSMO-EU + 24
- COSMO-EU + 48
- ▲ COSMO-EU + 72
- COSMO-RO + 24
- COSMO-RO + 48
- ▲ COSMO-RO + 72



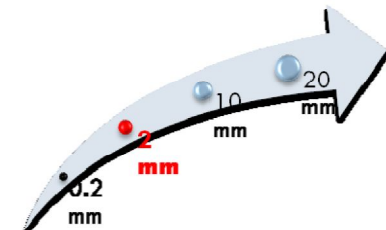
DJF2011-2012: Precipitation in 24h - 2mm threshold



MAM2012: Precipitation in 24h - 2mm threshold



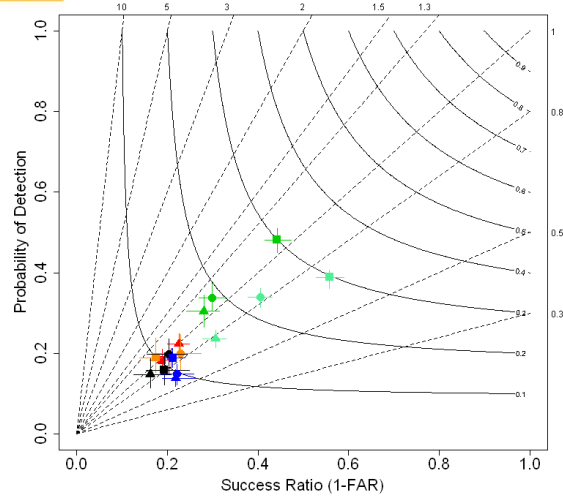
Reduction in FBI and general worsening of the scores. Apart from SON the tendency is to increase the number of false alarms



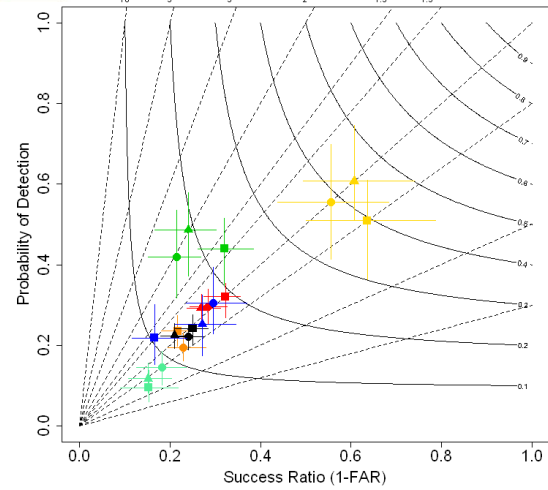
THRESHOLD



JJA2011: Precipitation in 24h - 10mm threshold



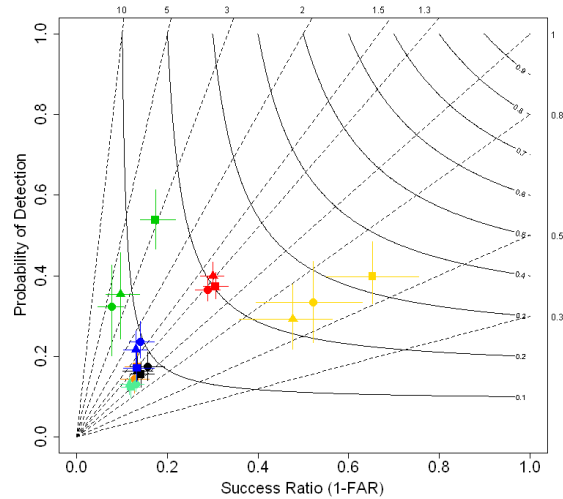
SON2011: Precipitation in 24h - 10mm threshold



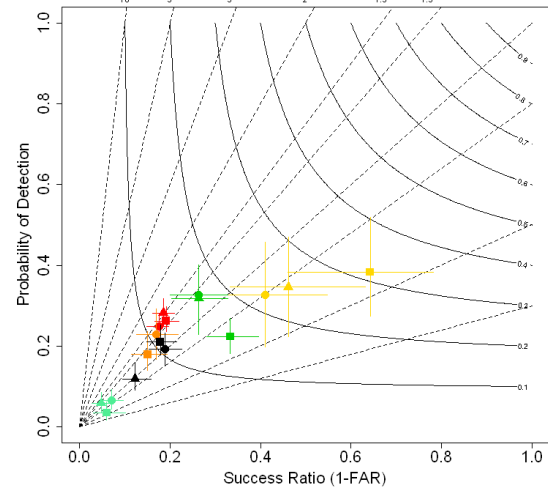
- COSMO-7 + 24
- COSMO-7 + 48
- ▲ COSMO-7 + 72
- COSMO-GR + 24
- COSMO-GR + 48
- ▲ COSMO-GR + 72
- COSMO-17 + 24
- COSMO-17 + 48
- COSMO-ME + 24
- COSMO-ME + 48
- ▲ COSMO-ME + 72
- COSMO-PL + 24
- COSMO-PL + 48
- ▲ COSMO-PL + 72
- COSMO-EU + 24
- COSMO-EU + 48
- ▲ COSMO-EU + 72
- COSMO-RO + 24
- COSMO-RO + 48
- ▲ COSMO-RO + 72



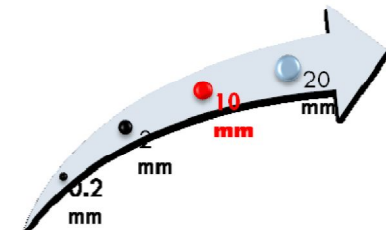
DJF2011-2012: Precipitation in 24h - 10mm threshold



MAM2012: Precipitation in 24h - 10mm threshold



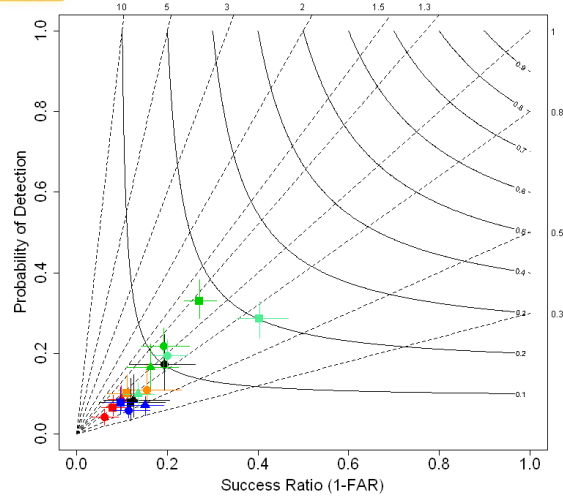
Further worsening of the scores. Good performance of COSMO-GR in SON (it is the best also in DJF and MAM)



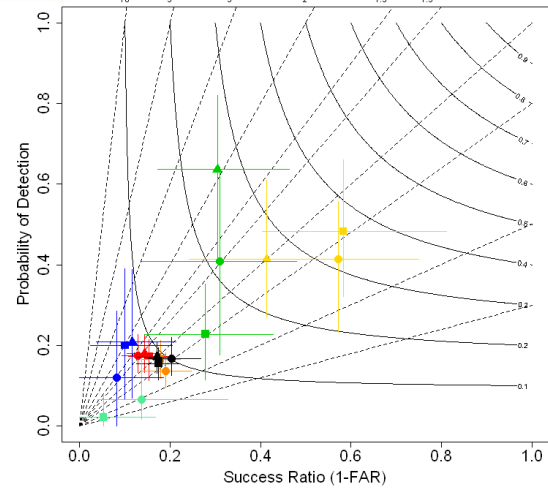
THRESHOLD



JJA2011: Precipitation in 24h - 20mm threshold



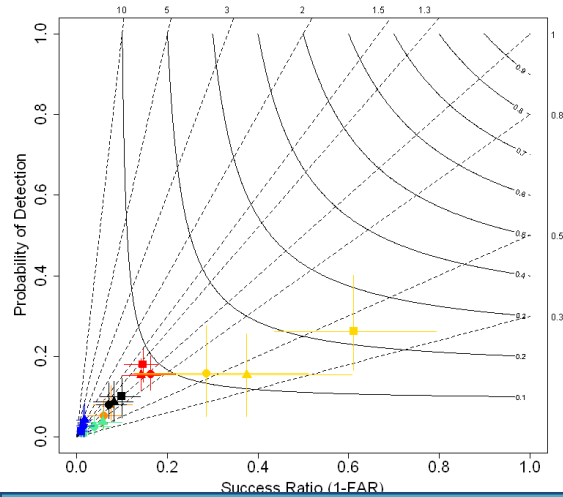
SON2011: Precipitation in 24h - 20mm threshold



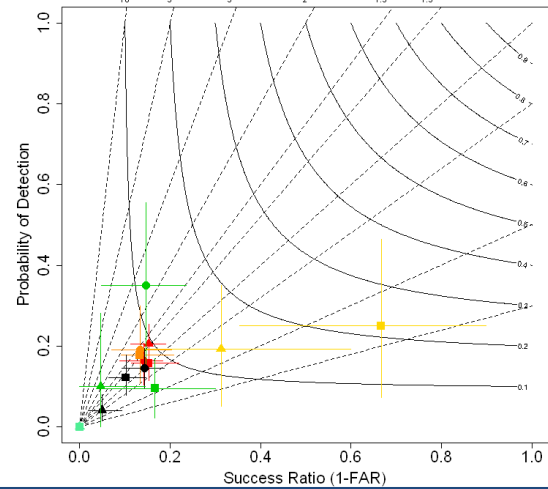
- COSMO-7 + 24
- COSMO-7 + 48
- ▲ COSMO-7 + 72
- COSMO-GR + 24
- COSMO-GR + 48
- ▲ COSMO-GR + 72
- COSMO-I7 + 24
- COSMO-I7 + 48
- COSMO-ME + 24
- COSMO-ME + 48
- ▲ COSMO-ME + 72
- COSMO-PL + 24
- COSMO-PL + 48
- ▲ COSMO-PL + 72
- COSMO-EU + 24
- COSMO-EU + 48
- ▲ COSMO-EU + 72
- COSMO-RO + 24
- COSMO-RO + 48
- ▲ COSMO-RO + 72



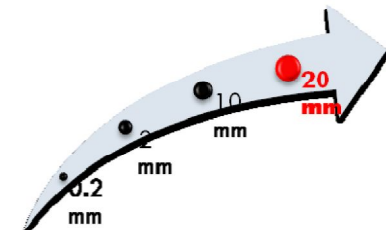
DJF2011-2012: Precipitation in 24h - 20mm threshold



MAM2012: Precipitation in 24h - 20mm threshold



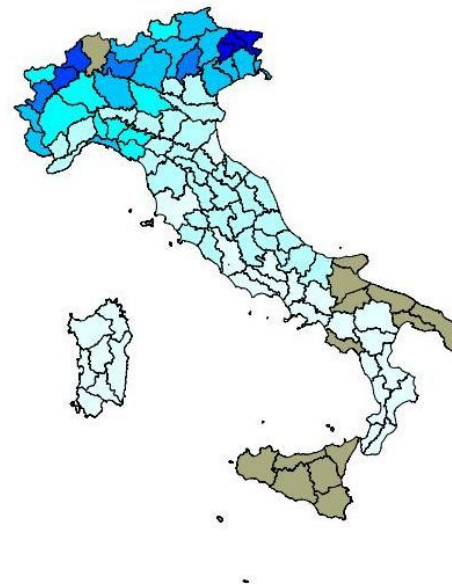
Quite low values for TS and POD (except from COSMO-GR in SON and COSMO-PL). **The dimension of the cross-hairs indicates high variability in the contingency table entries.**



THRESHOLD

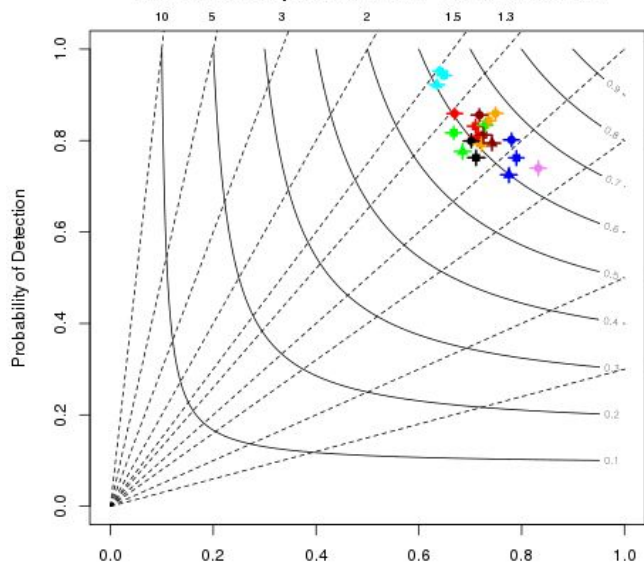
INTER-COMPARISON OVER THE SAME DOMAIN

- In the previous diagrams the shown scores were evaluated on each own country
- Arpa-Piemonte performed a verification over a common domain (a part of Italy) using high resolution rain-gauges network for some COSMO models:
 - COSMO-I7 and COSMO-ME
 - COSMO-I2 and COSMO-IT
 - COSMO-7
 - COSMO-EU
 - COSMO-GR
 - IFS-ECMWF

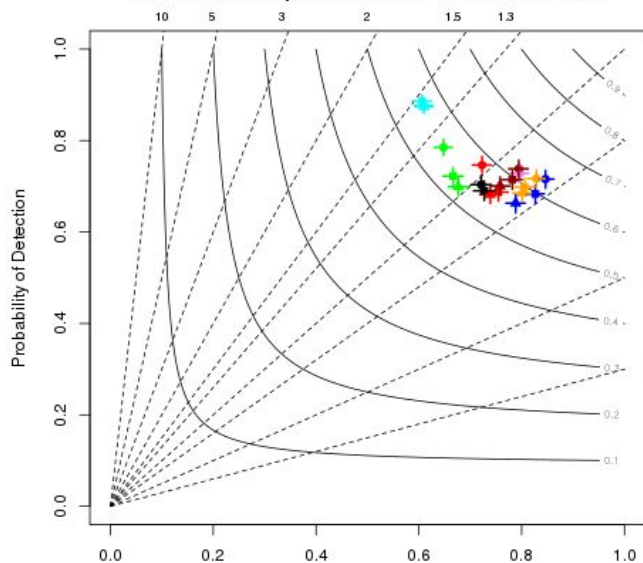




JJA2011: Precipitation in 24h - 0.2 mm threshold



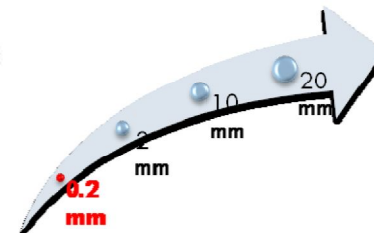
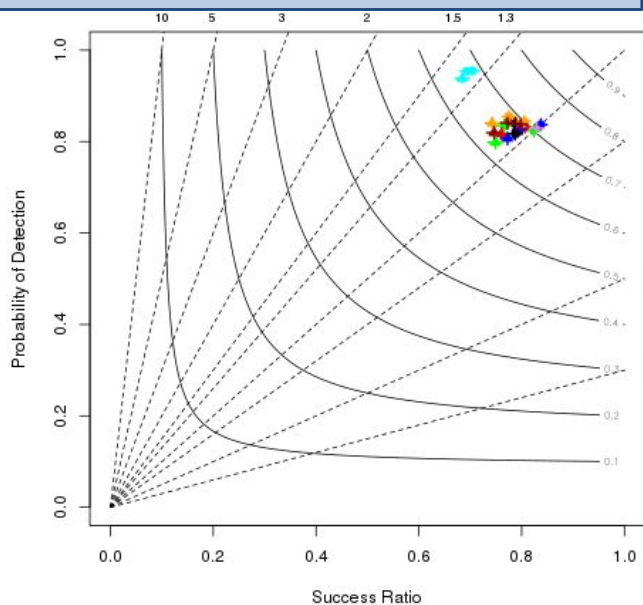
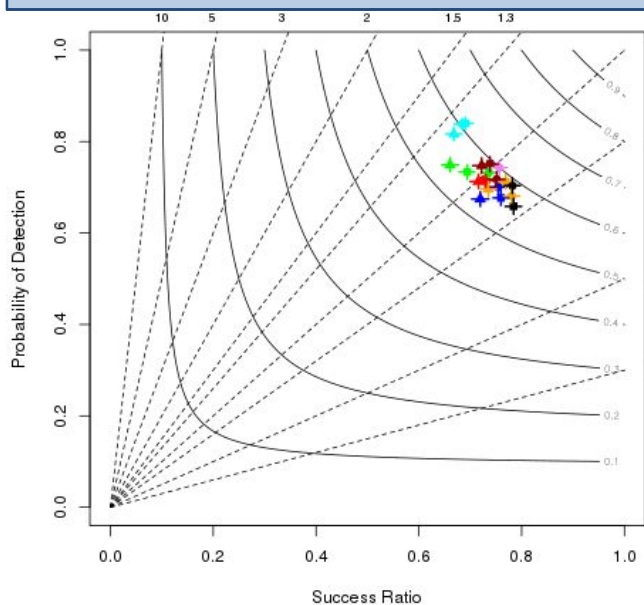
SON2011: Precipitation in 24h - 0.2 mm threshold



Average over area > 0.2 mm/24h

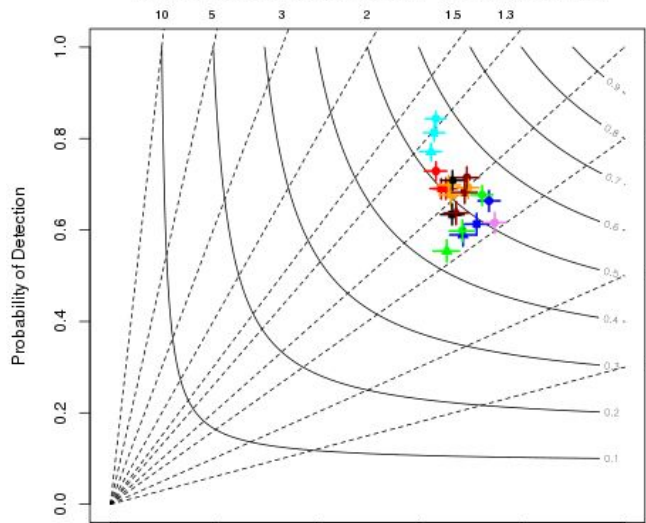
- I7 + 24
- I7 + 48
- △ I7 + 72
- 7 + 24
- 7 + 48
- △ 7 + 72
- EU + 24
- EU + 48
- △ EU + 72
- ME + 24
- ME + 48
- △ ME + 72
- I2 + 24
- I2 + 48
- △ I2 + 48
- IT + 24
- GR + 24
- GR + 48
- △ GR + 72
- ECMWF + 24
- ECMWF + 48
- △ ECMWF + 72

The difference between models are small. Scores are generally better (the verification methodology used less penalizes positioning errors - see COSMO-I7 and COSMO-ME: their verification region is unchanged)

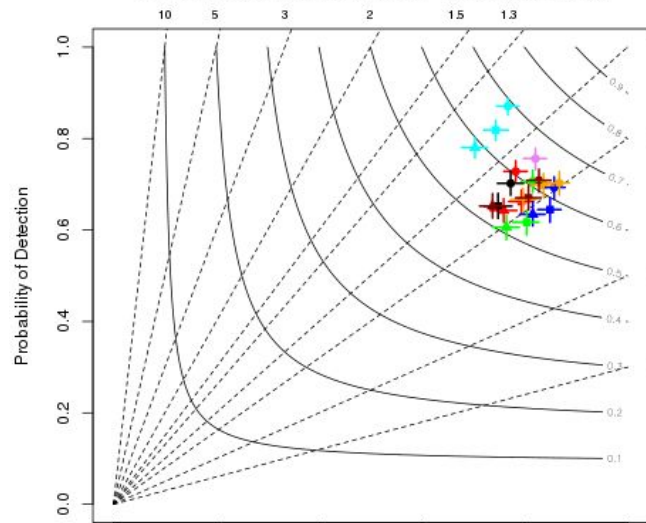




JJA2011: Precipitation in 24h - 2.0 mm threshold



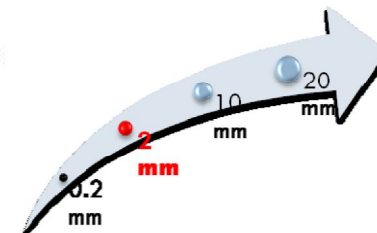
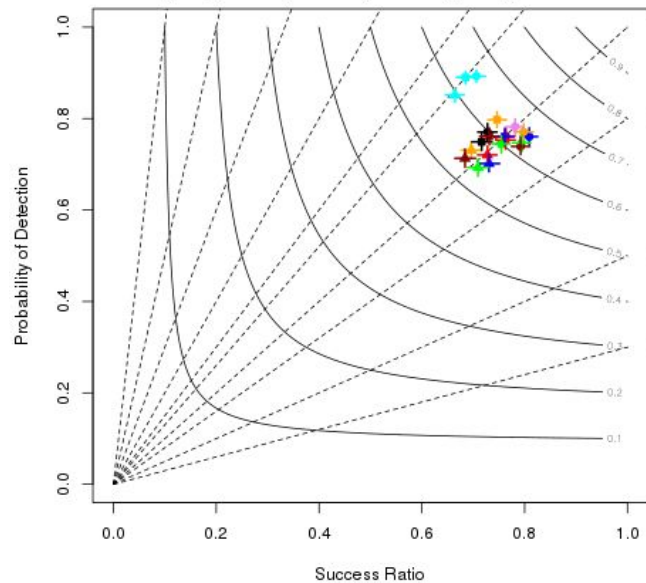
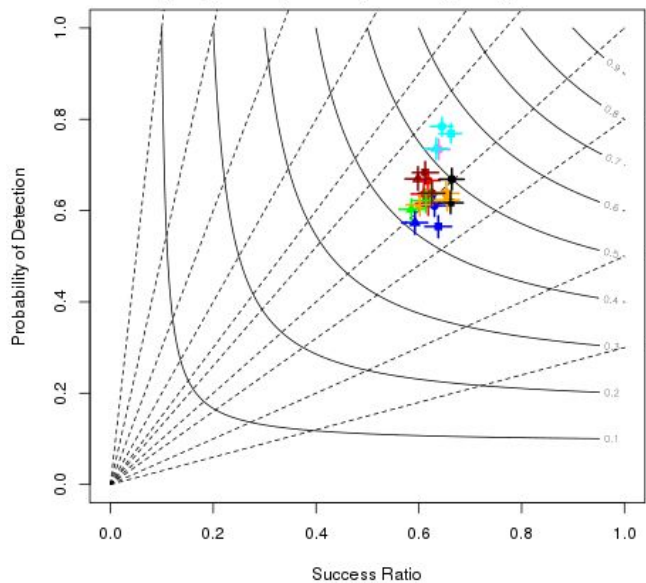
SON2011: Precipitation in 24h - 2.0 mm threshold



Average over area > 2 mm/24h

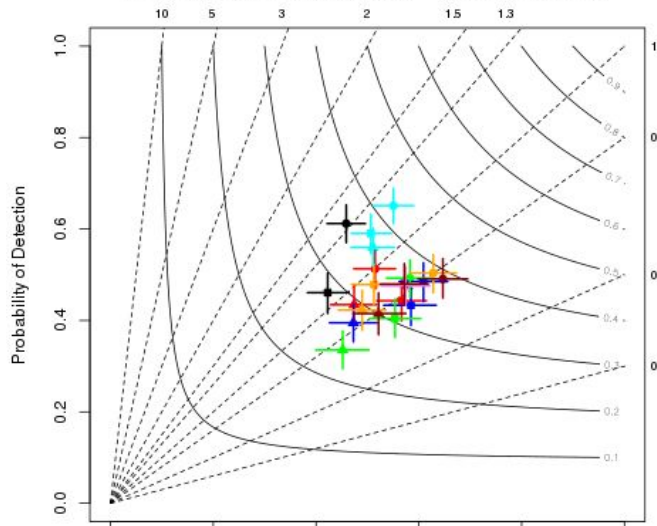
FBI near 1 in DJF and MAM, tendency to underforecast for COSMO-7 and COSMO-EU, in particular during JJA. General underestimation in SON. Note ECMWF overestimation of the number of events in spite of high POD. Good performance of all COSMO models.

- I7 + 24
- I7 + 48
- △ I7 + 72
- 7 + 24
- 7 + 48
- △ 7 + 72
- EU + 24
- EU + 48
- △ EU + 72
- ME + 24
- ME + 48
- △ ME + 72
- I2 + 24
- I2 + 48
- △ I2 + 72
- IT + 24
- GR + 24
- △ GR + 48
- GR + 72
- ECMWF + 24
- ECMWF + 48
- △ ECMWF + 72

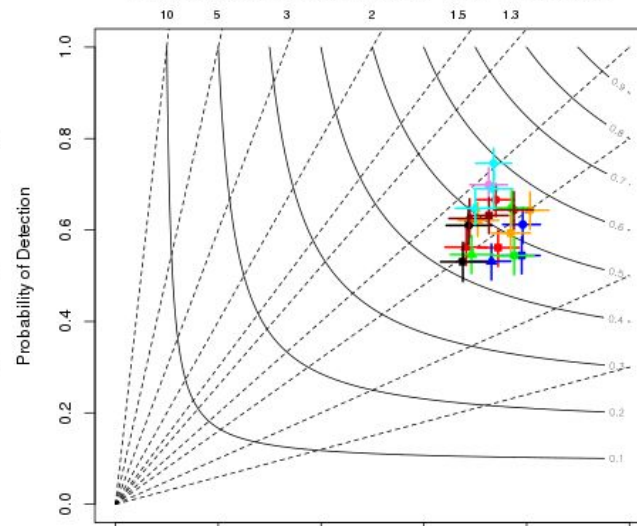




JJA2011: Precipitation in 24h - 10.0 mm threshold



SON2011: Precipitation in 24h - 10.0 mm threshold

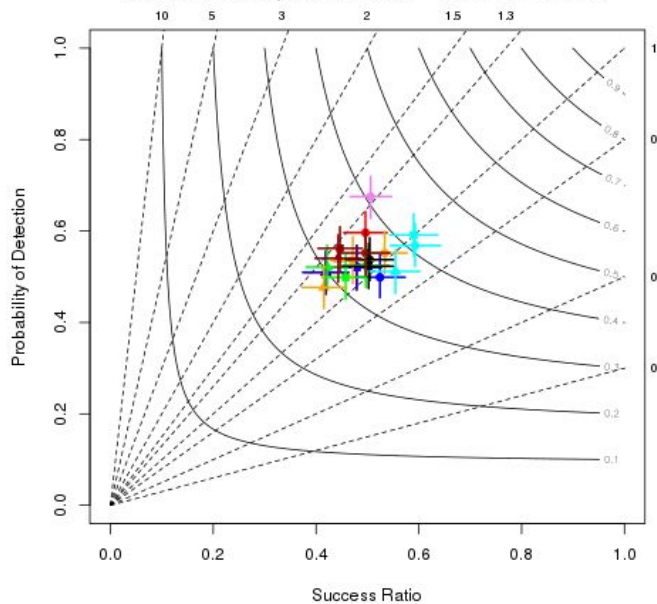


Average over area > 10 mm/24h

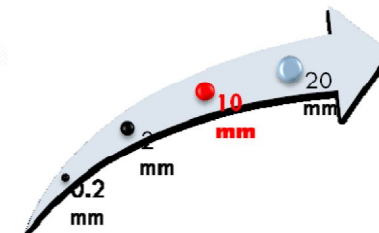
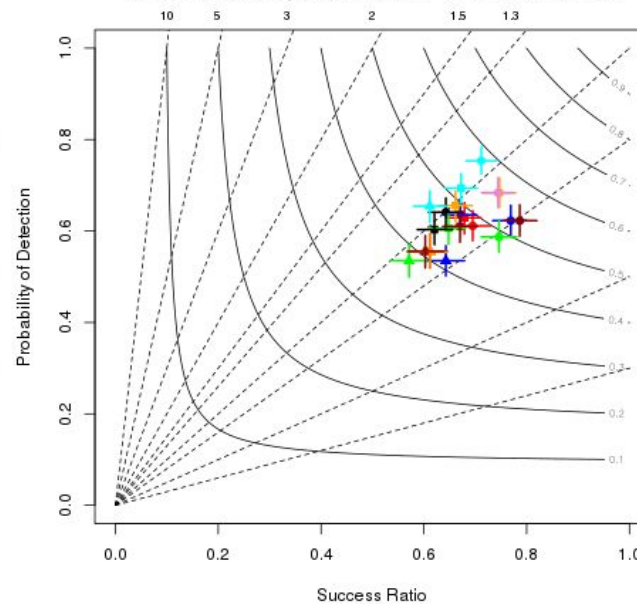
- I7 + 24
- I7 + 48
- △ I7 + 72
- 7 + 24
- 7 + 48
- △ 7 + 72
- EU + 24
- EU + 48
- △ EU + 72
- ME + 24
- ME + 48
- △ ME + 72
- I2 + 24
- I2 + 48
- △ I2 + 72
- IT + 24
- GR + 24
- △ GR + 48
- GR + 72
- ECMWF + 24
- ECMWF + 48
- △ ECMWF + 72

General decrease in FBI. Over estimation in DJF could be linked with errors in observation because of snow precipitations. POD and TS have good values. COSMO-IT very good performance in MAM.

DJF2012: Precipitation in 24h - 10.0 mm threshold

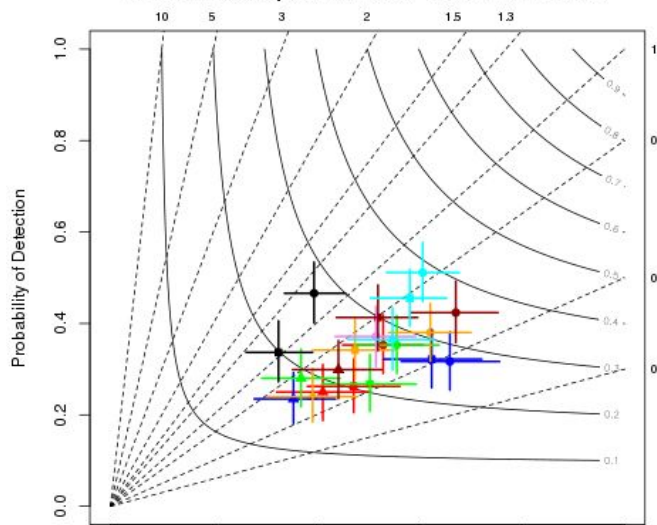


MAM2012: Precipitation in 24h - 10.0 mm threshold

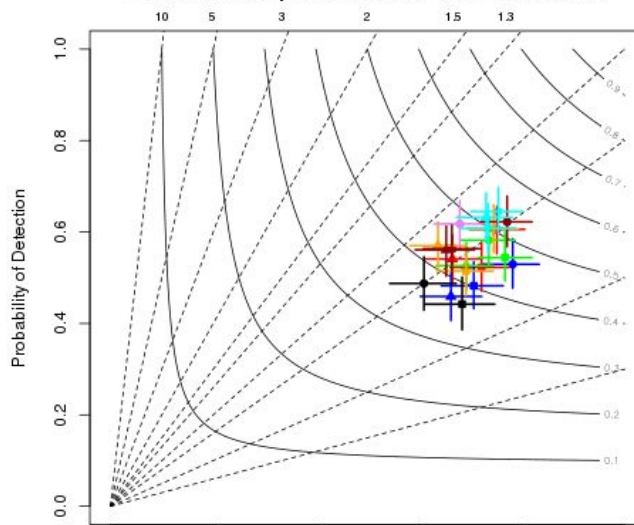




JJA2011: Precipitation in 24h - 20.0 mm treshold



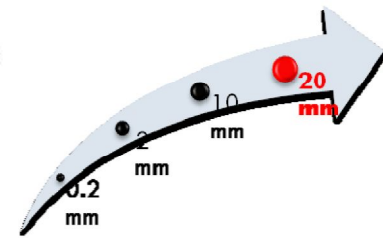
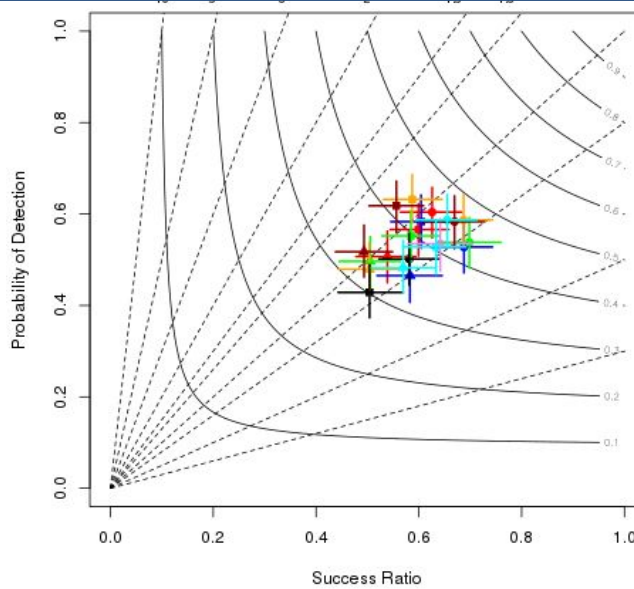
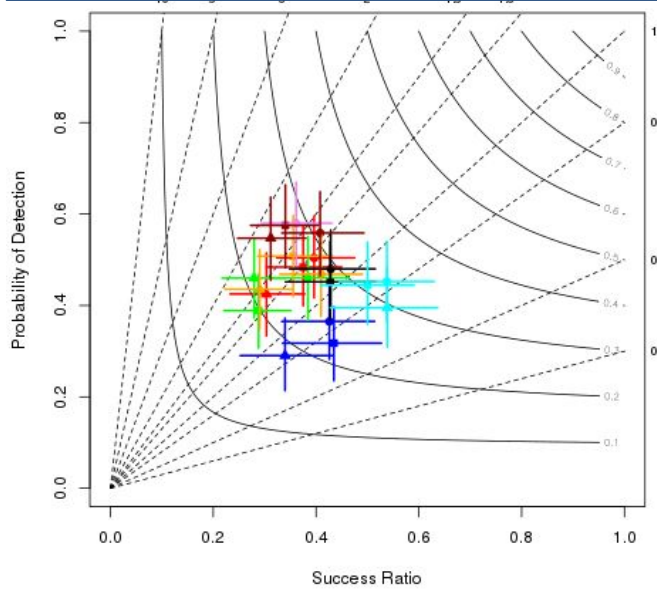
SON2011: Precipitation in 24h - 20.0 mm treshold



Average over area > 20 mm/24h

Further underestimation of FBI , even if in DJF most of the models overestimates, except COMSO-7 and ECMWF (remember problems in observation because of snow precipitations) . Increase in the number of False Alarms.

- I7 + 24
- I7 + 48
- △ I7 + 72
- 7 + 24
- 7 + 48
- △ 7 + 72
- EU + 24
- EU + 48
- △ EU + 72
- ME + 24
- ME + 48
- △ ME + 72
- I2 + 24
- I2 + 48
- △ I2 + 72
- IT + 24
- GR + 24
- △ GR + 48
- GR + 72
- ECMWF + 24
- ECMWF + 48
- △ ECMWF + 72



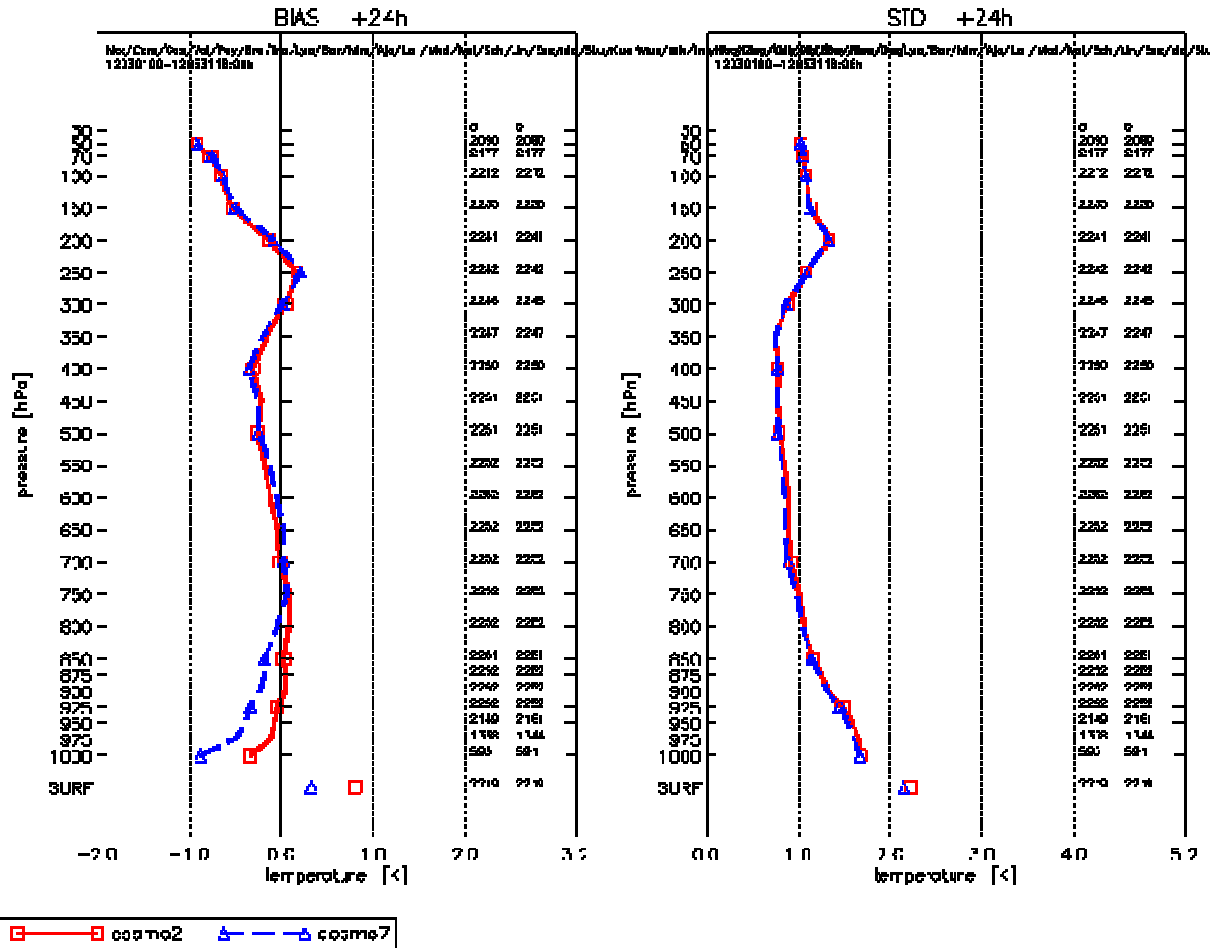
Verification of vertical profiles (Task 2.1)

WCG5



TEMPS verification: temperature +24h Spring 2012

JA verification: COSMO-2 vs. COSMO-7 operational set for Mar/Apr/May 2012 (yyyyss = 2012s?)
file included: verif-2-for/cosmo2-0006-cosmo2012s2-tdk-verif-2-for/cosmo2-0006-cosmo7012s2-tdk



all TEMPs
COSMO-2
domain

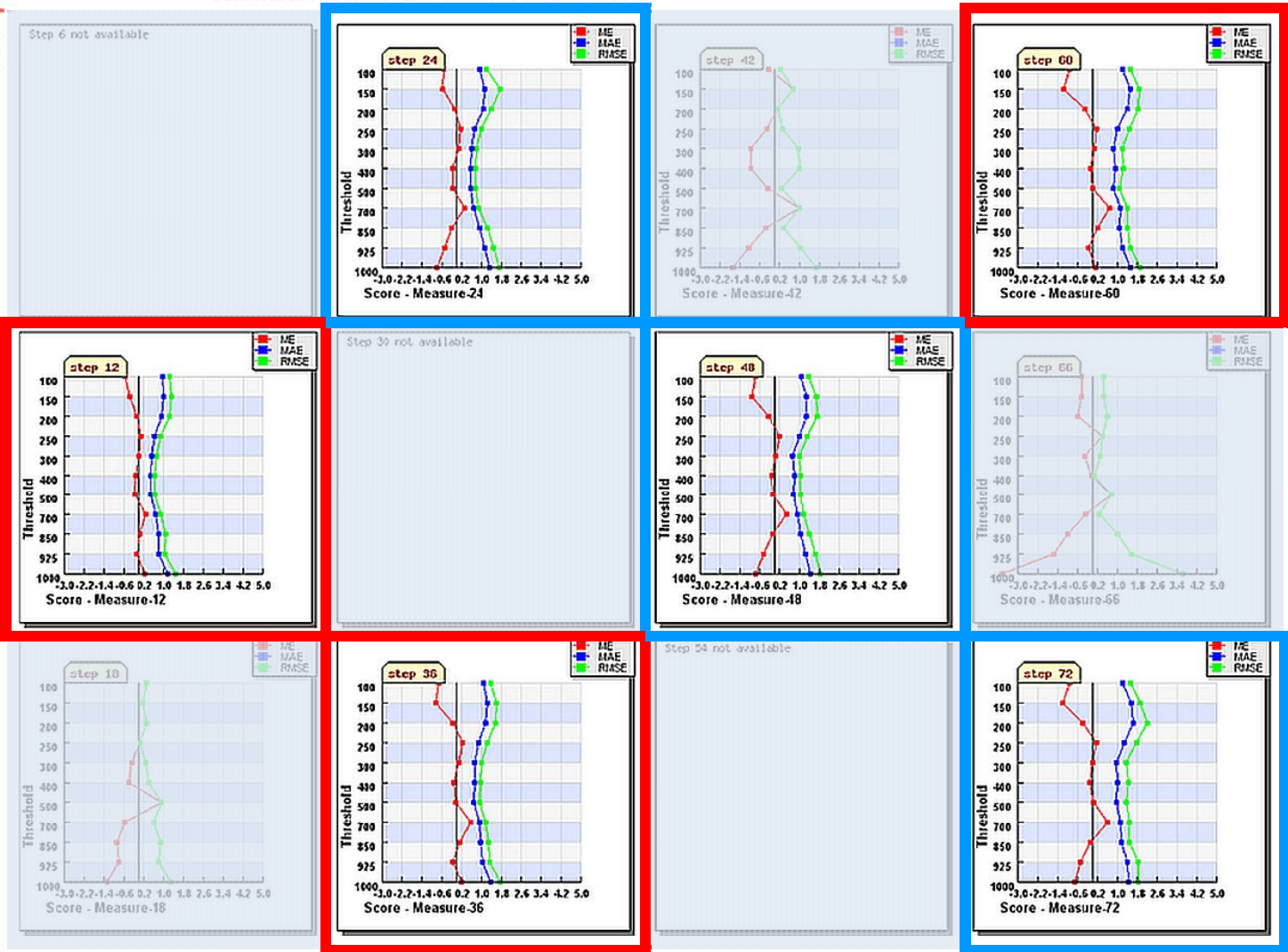
— COSMO-7
— COSMO-2



COSMOE Seasonal Run 00 Temperature-Italy - 00 Run
 Stratification : All Italian TEMP Station - Period: MAM 2012

Upper Air Temperature COSMO-ME MAM 2012

- underestimation under 700 hPa only at 00 UTC
- overestimation at 700 hPa increasing with forecast time
- nearly no bias at 12 UTC (except 700 hPa)
- “usual” overestimation at higher levels

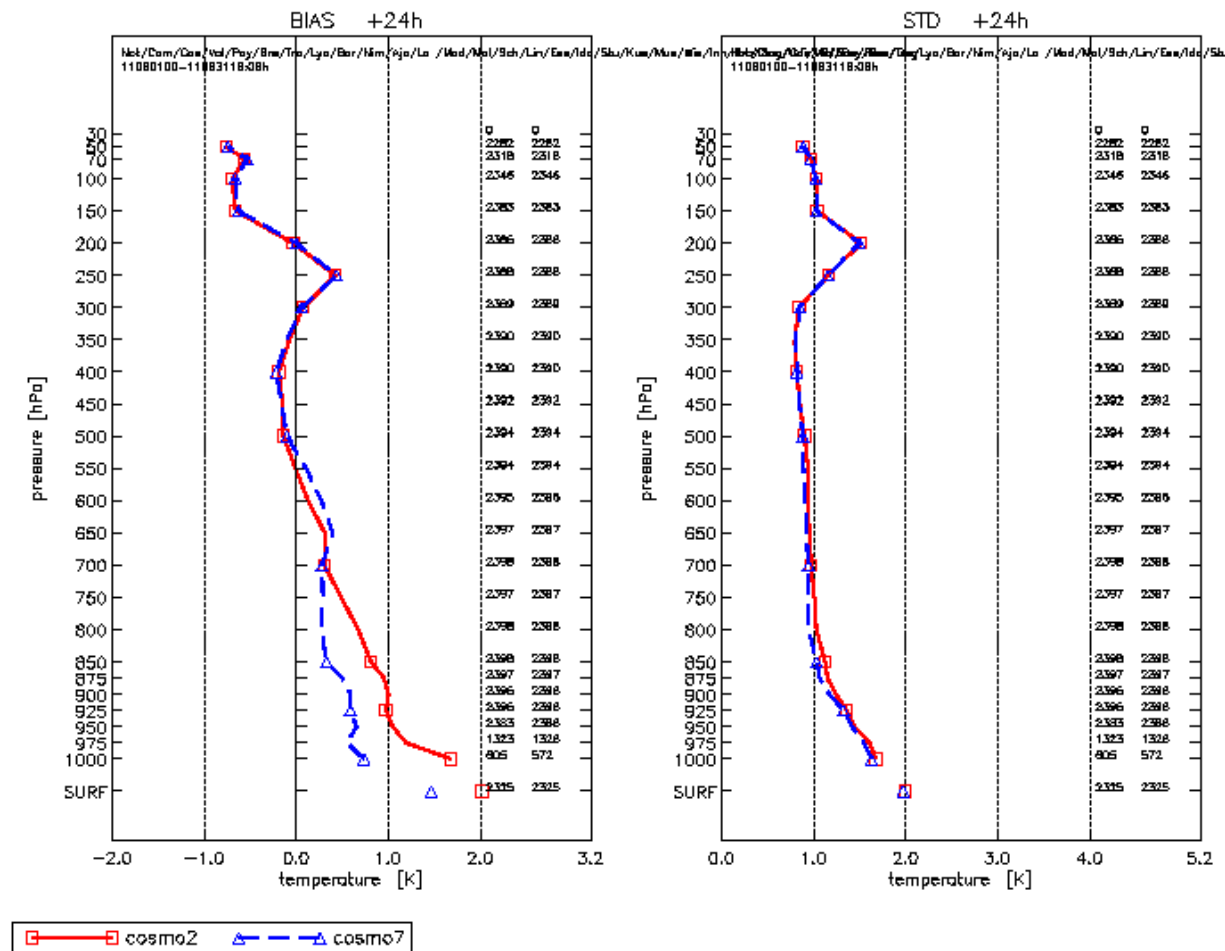


■ 00 UTC
 ■ 12 UTC



TEMPS verification: temperature +24h Summer 2011

UA verification: COSMO-2 vs. COSMO-7 operational set for Jun/Jul/Aug 2011 (yyyyss = 2011s3)



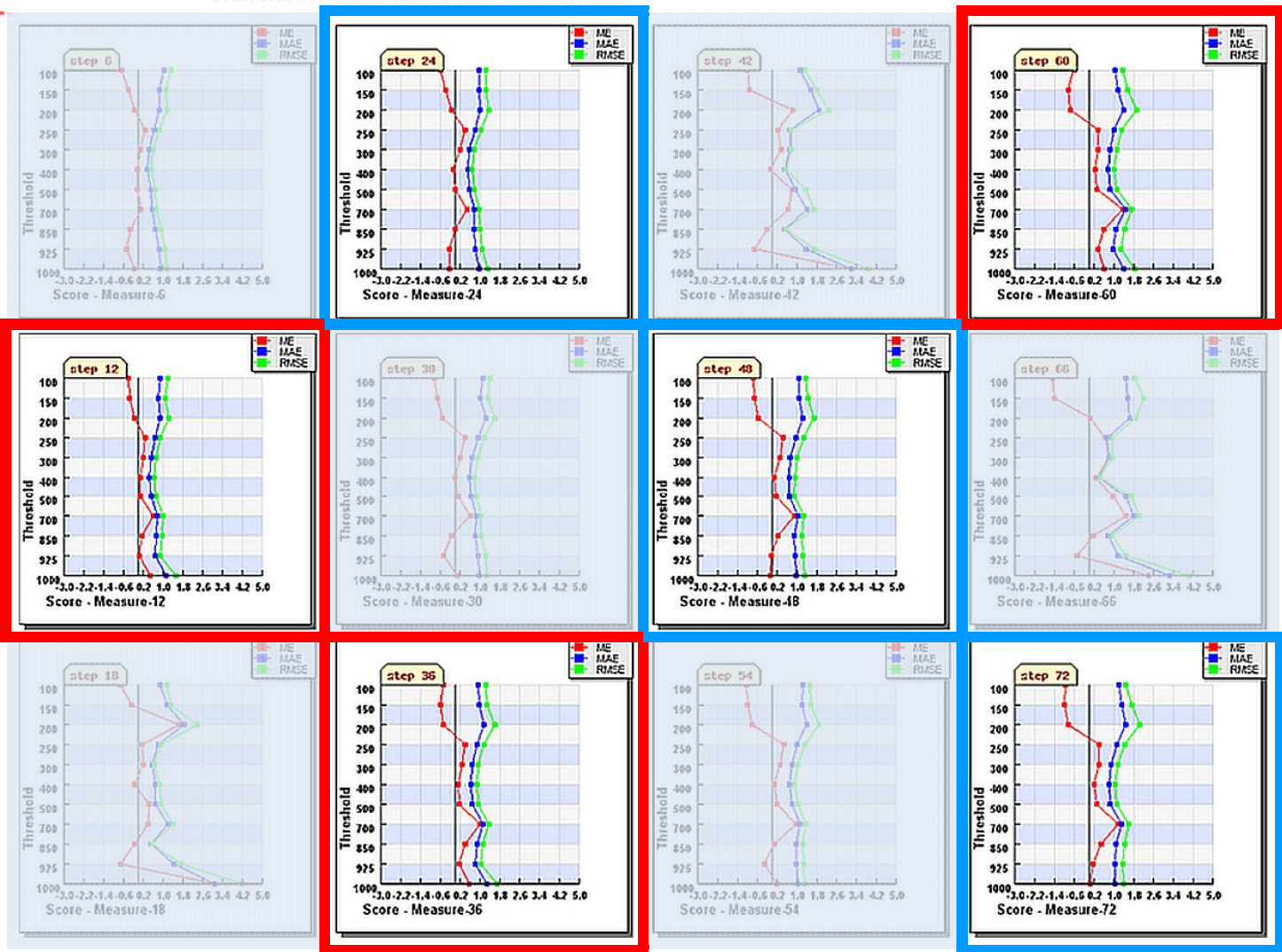
all TEMPs
COSMO-2
domain

— COSMO-7
— COSMO-2



Upper Air Temperature COSMO-ME JJA 2011

COSMOME Seasonal Run 00 Temperature-Italy - 00 Run
Stratification : All Italian TEMP Station - Period: JJA 2011



- underestimation above 250 hPa
- overestimation at 250 hPa and 700 hPa increasing with forecast time
- ME increases with forecast time (*"the model seems to warm"*)
- Compared to COSMO-17 seems warmer in particular from 700 hPa and 1000 hPa

■ 00 UTC
■ 12 UTC

High density verification of Precipitation over Italy (Task 3.1)

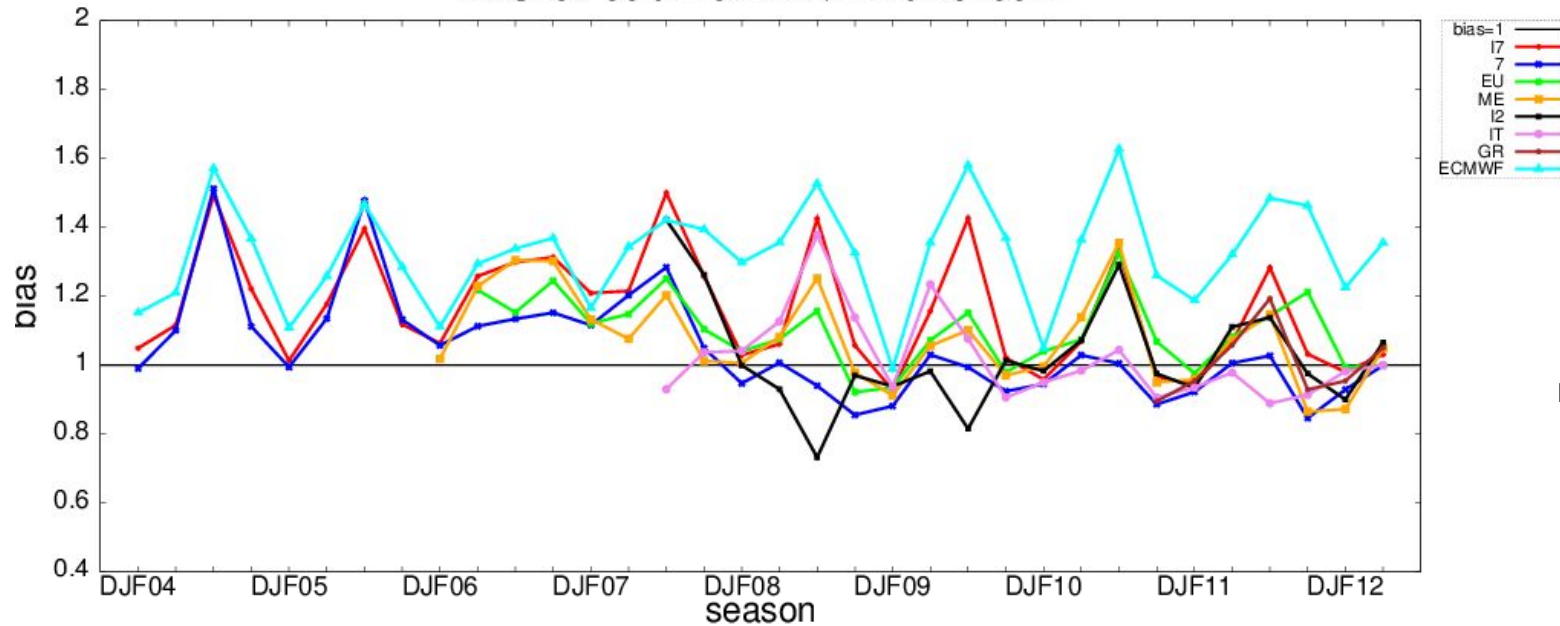
WCG5



Seasonal trend 0.2mm/24h + ECMWF

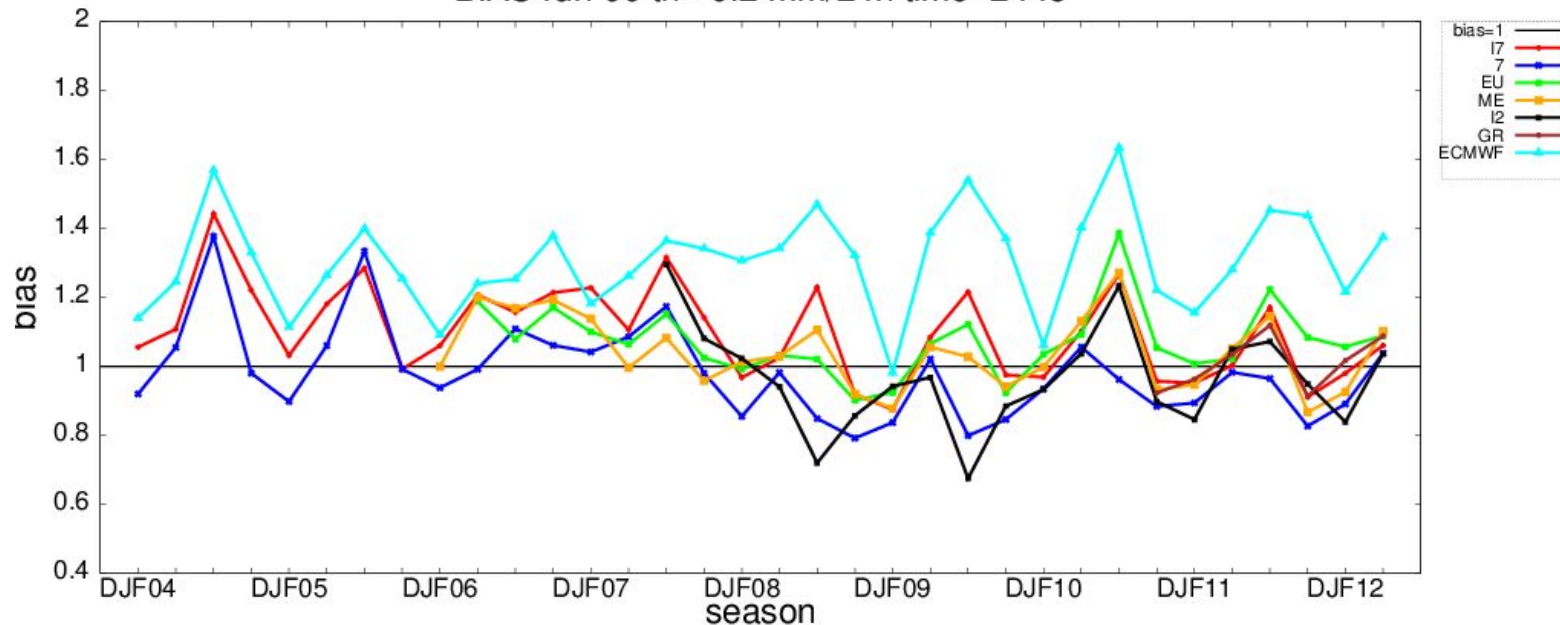


BIAS run 00 th= 0.2 mm/24h time=0024



Dataset: high resolution network of rain gauges coming from COSMO dataset and Civil Protection Department → 1300 stations
Method: 24h averaged cumulated precipitation value over 90 meteorological basins

BIAS run 00 th= 0.2 mm/24h time=2448



All the versions present a seasonal cycle with an overestimation during summertime (except COSMO-7 and IT)
COSMO-7 and IT underestimate
Overestimation error decreases in D+2 (spin-up effect vanished)
Big overestimation for ECMWF (and EU)

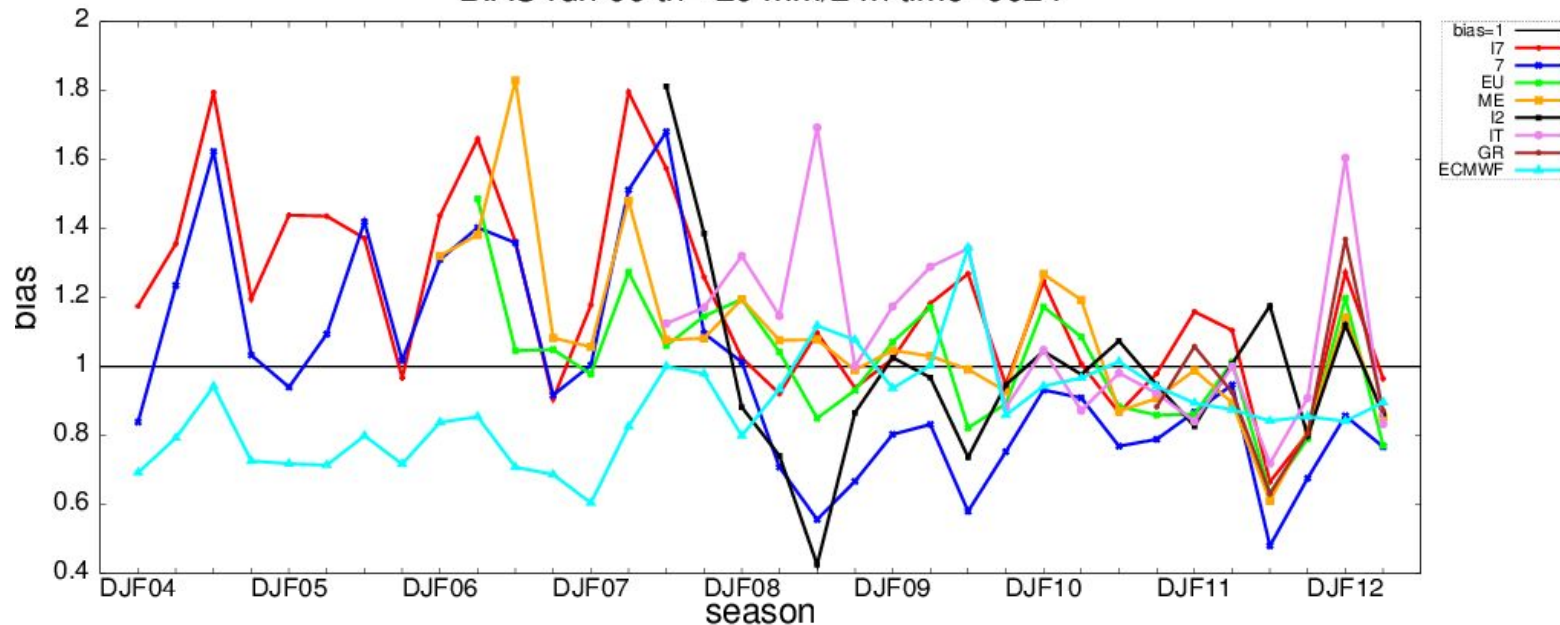




Seasonal trend 20mm/24h

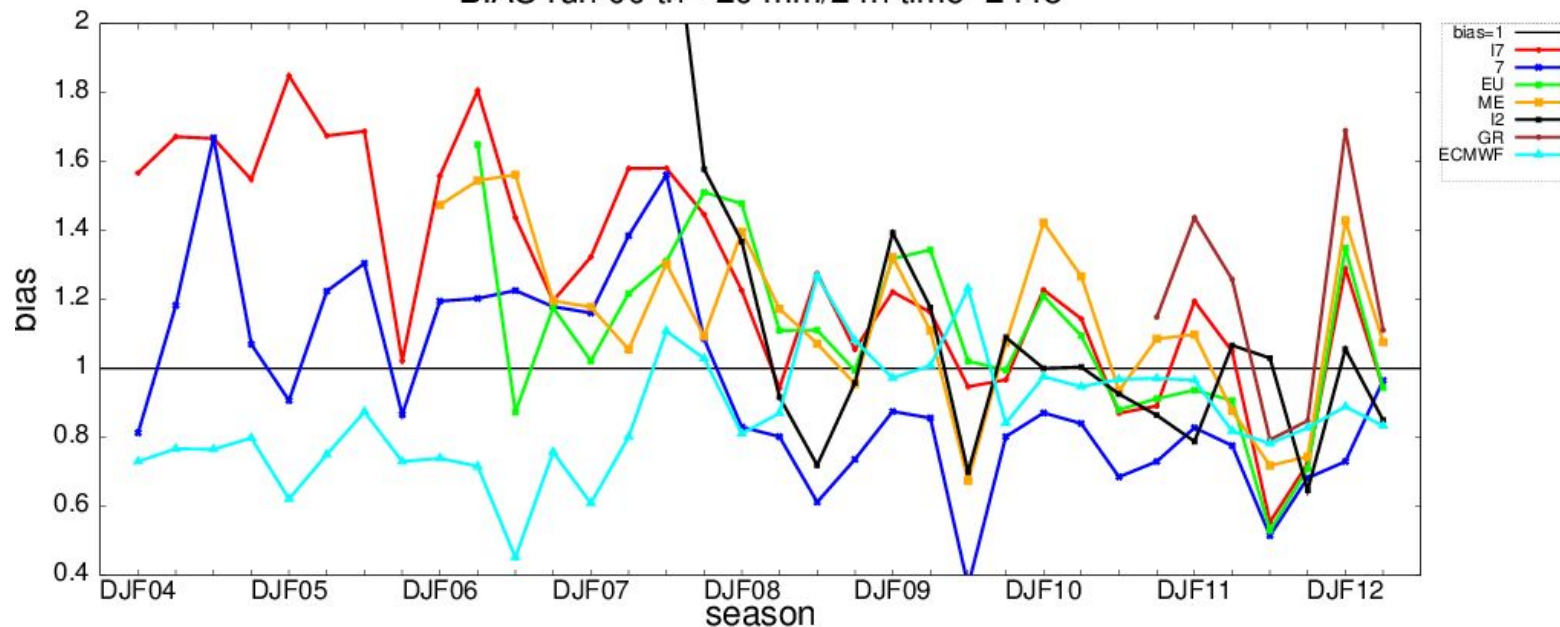
+ ECMWF

BIAS run 00 th= 20 mm/24h time=0024



- Slight bias reduction during latest seasons (except for latest winter!)
- winter 2012: all the versions overestimate (due to lack of representativeness of the rain gauges over the plain during snowfall??)

BIAS run 00 th= 20 mm/24h time=2448



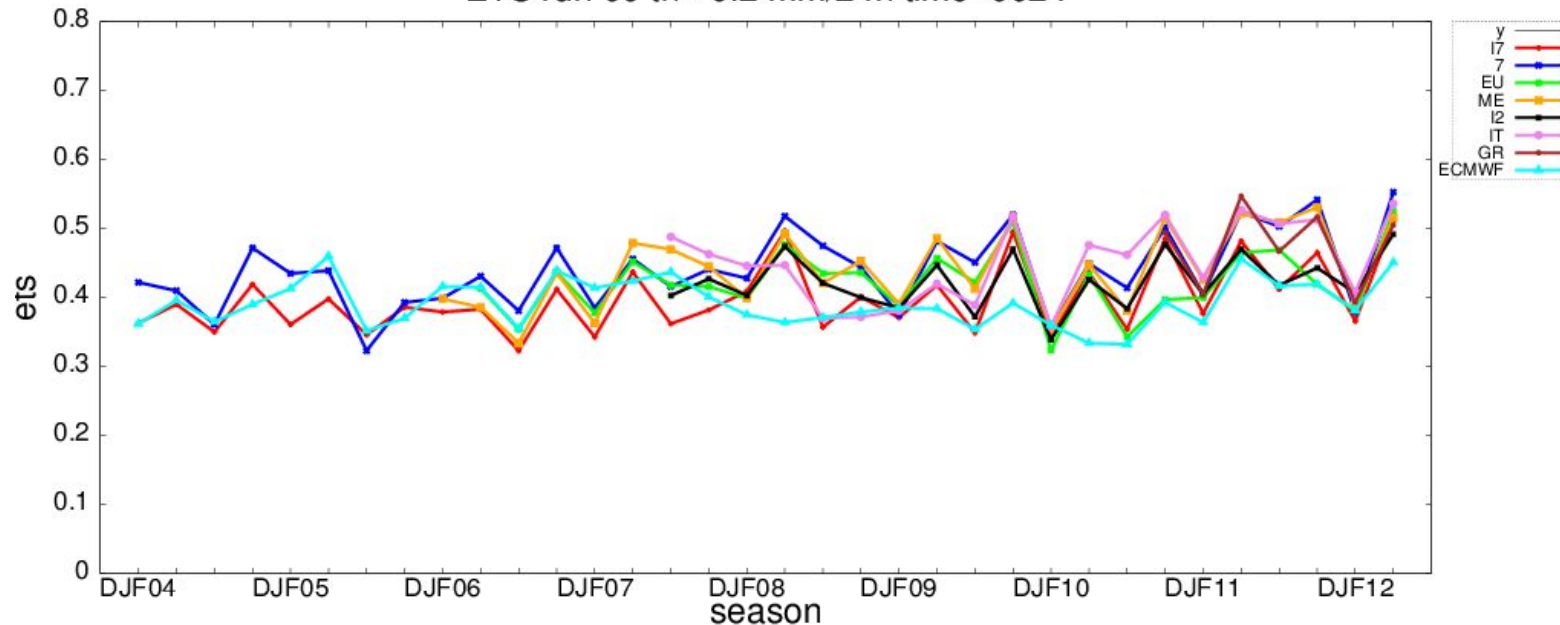
- Strong COSMO-7 underestimation
- ECMWF underestimates around 10%



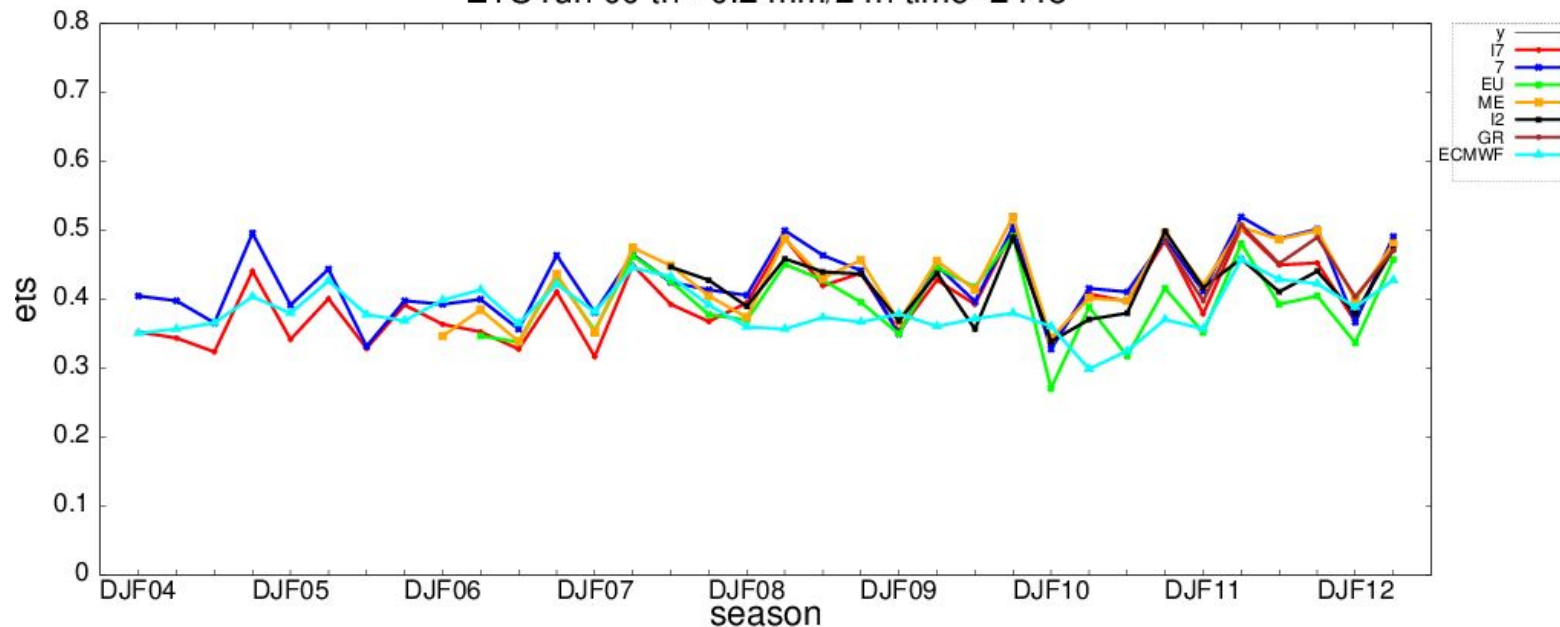
Seasonal trend 0.2mm/24h

+ ECMWF

ETS run 00 th= 0.2 mm/24h time=0024



ETS run 00 th= 0.2 mm/24h time=2448



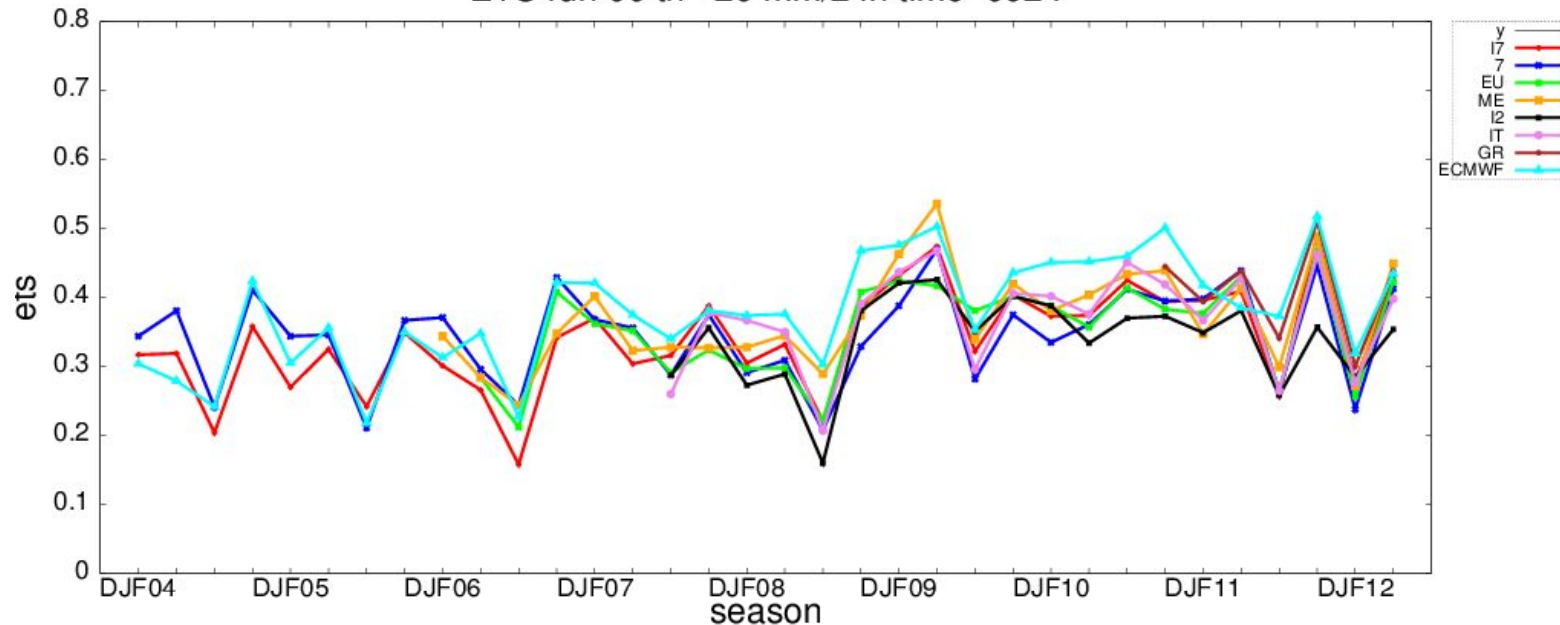
- Stationary improvement trend
- Big “negative” peaks during wintertime
- Seasonal error cycle: lower ets during winter and summertime
 - Low ets for ECMWF and EU
 - no significant differences between D+1 and D+2
 - winter 2010 (very snowy particularly in Northern Italy)/winter 2011/winter 2012: low ets value (D+1 and D+2) → model error or lack of representativeness of the rain gauges over the plain during snowfall ?



Seasonal trend 20mm/24h

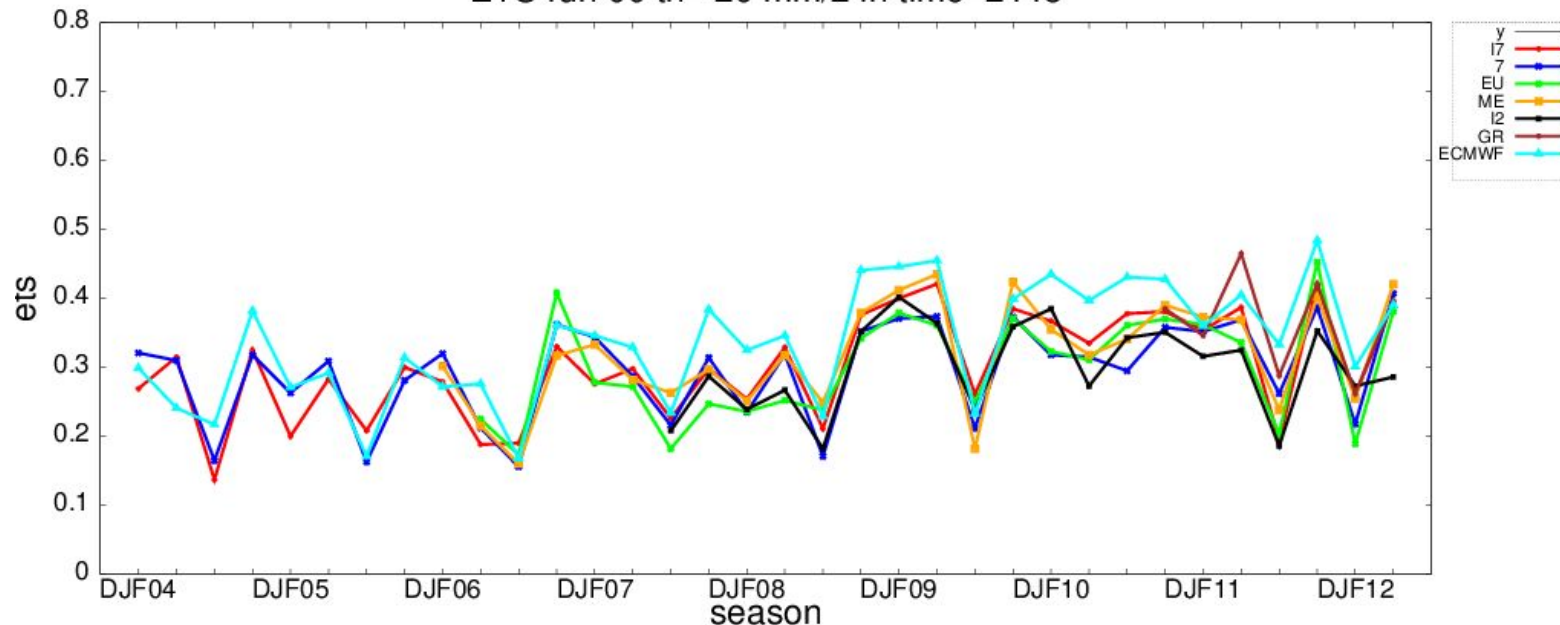
+ ECMWF

ETS run 00 th= 20 mm/24h time=0024



- Big variability during latest year
- Good skill for ecmwf!!!
- Very low values during JJA12 and DJF12
- All the versions present two "big jump" at jja08 and jja09, after the values increase and become quite stationary
- Skill decreases with forecast time

ETS run 00 th= 20 mm/24h time=2448



Long Term Trends (Task 3.4)

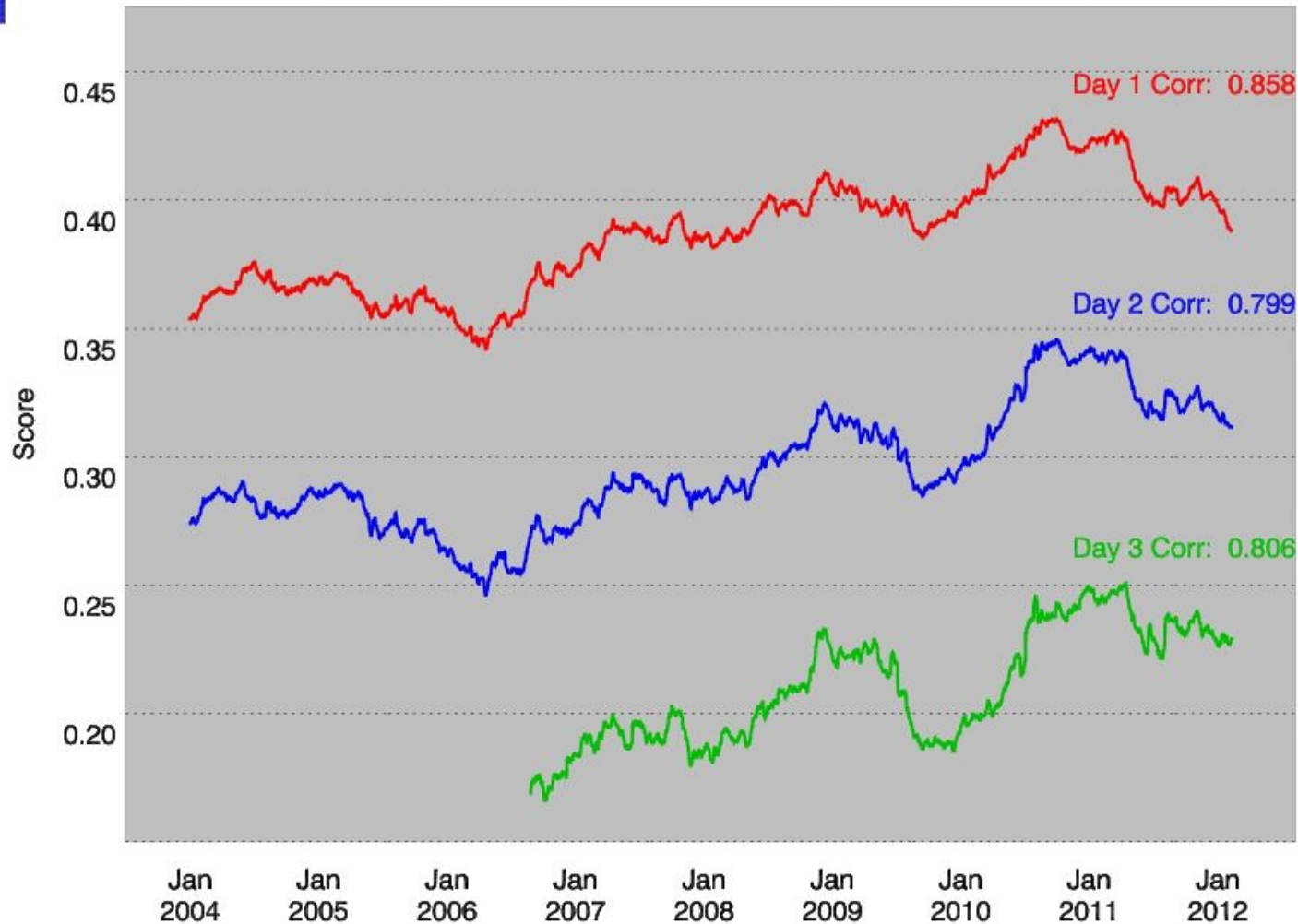
WCG5

COSI – long term trends: Overview

Deutscher Wetterdienst
Wetter und Klima aus einer Hand



Universal Score Period 01.07.2003 till 25.08.2012
averaging interval 365 days: All forecast days



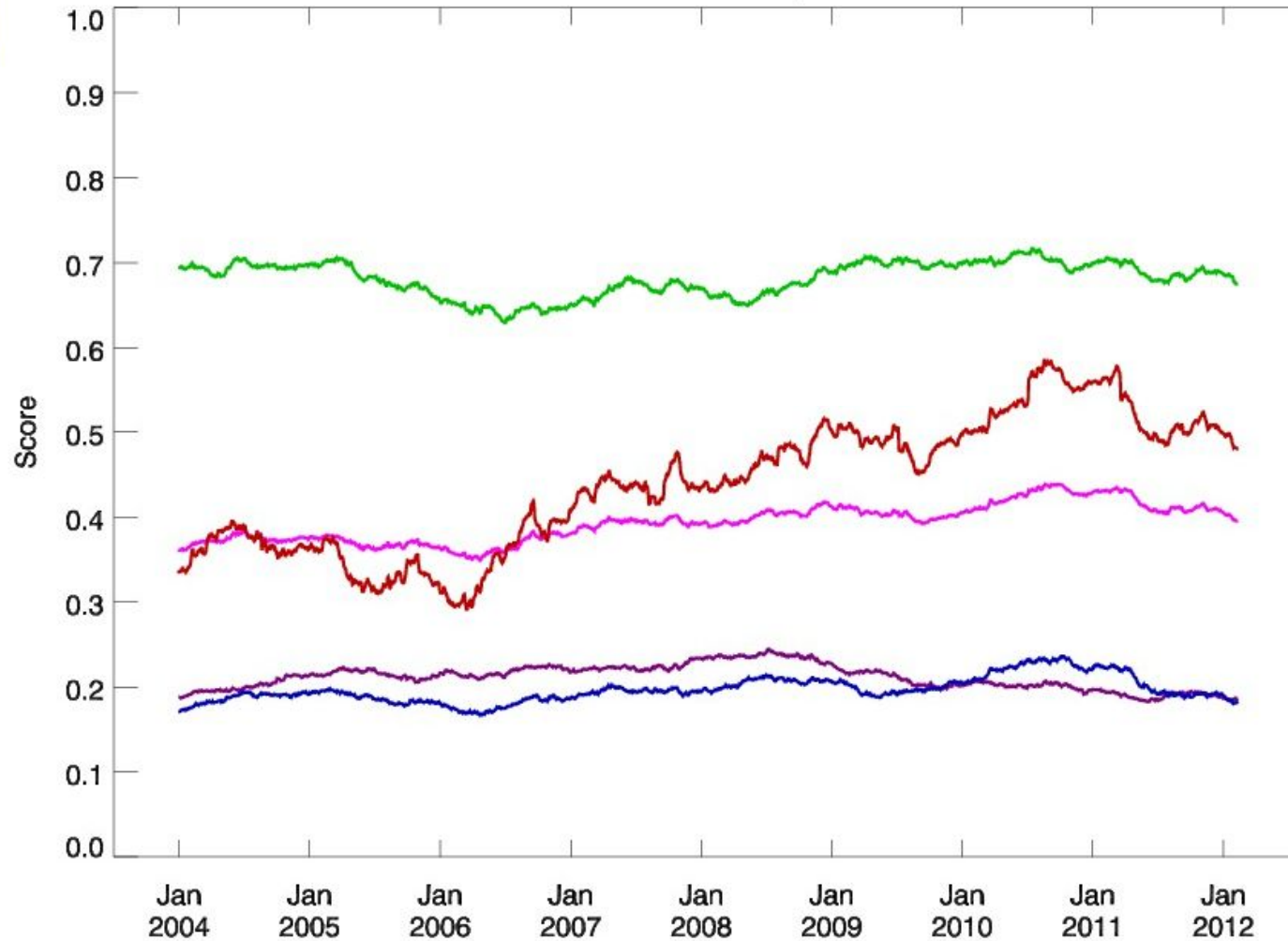
31.08.2012 12:02:12 MESZ



COSI – long term trends: Day 1



All Scores Day 1



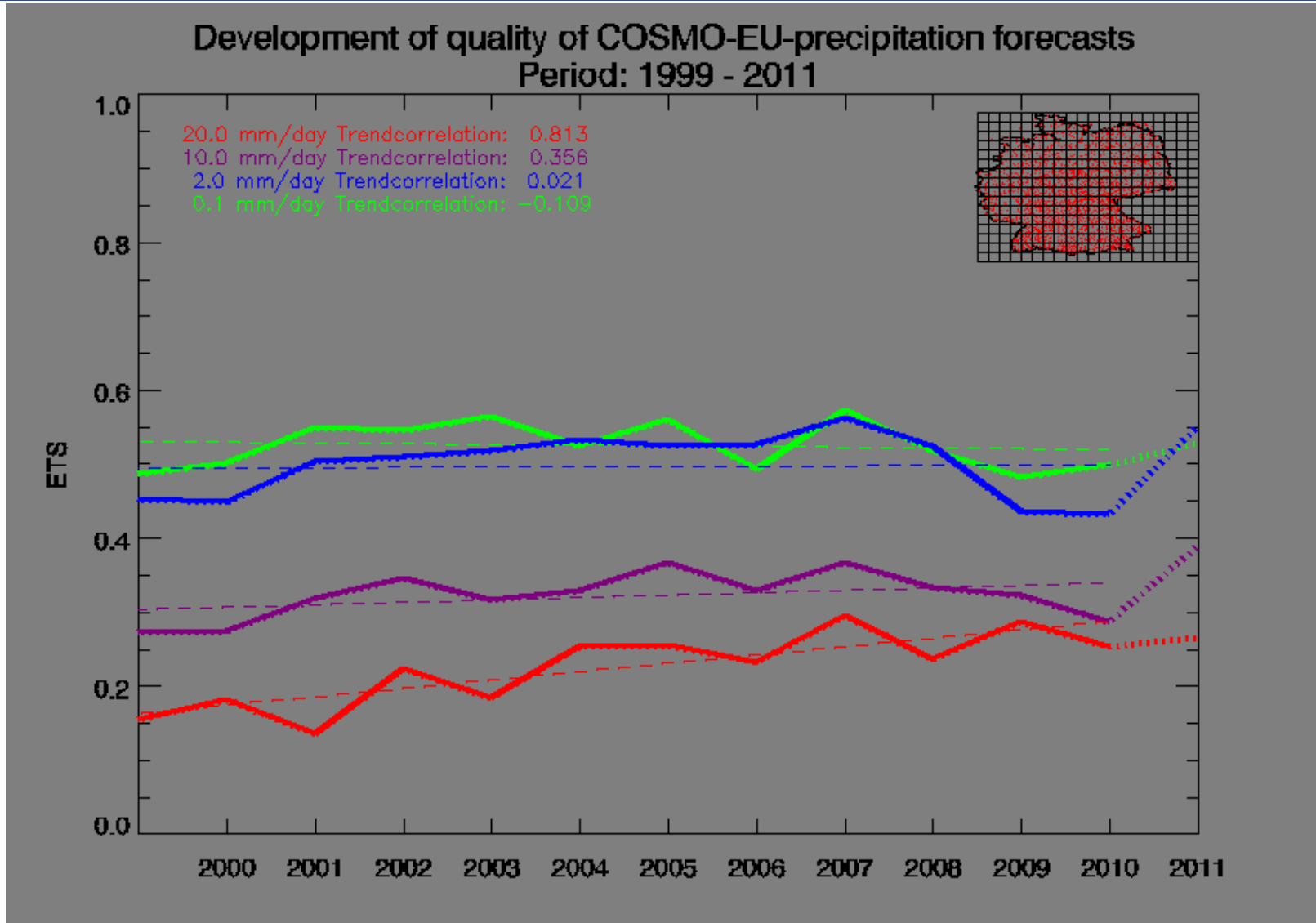
Universal Score Cloud cover Vector wind Temperature Precipitation

31.08.2012 12:02:06 MESZ



Long term trend of QPF quality (high density observation network): Equitable threat score

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

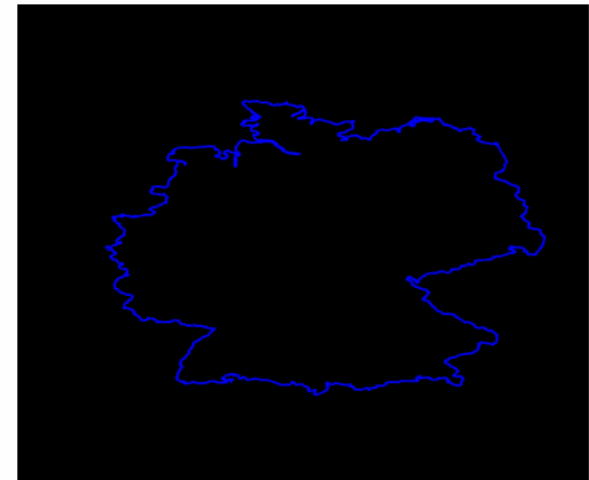
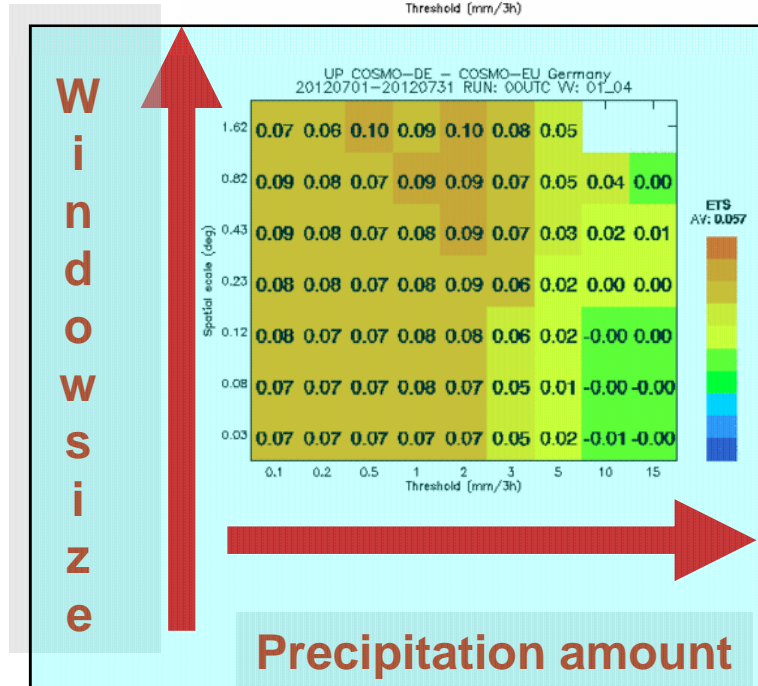
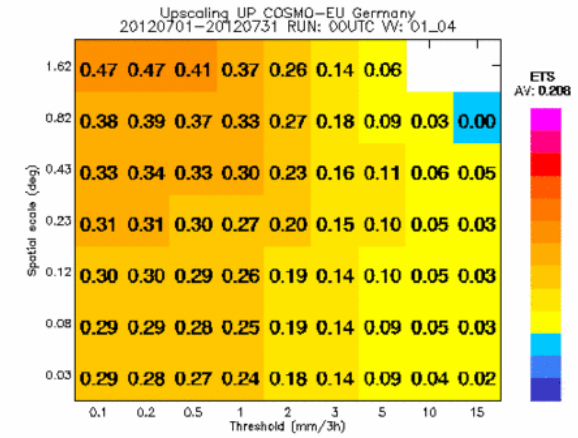
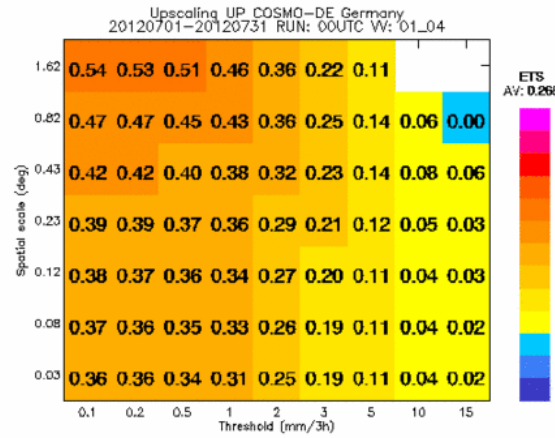


Neighborhood Methods (Task 4.2)

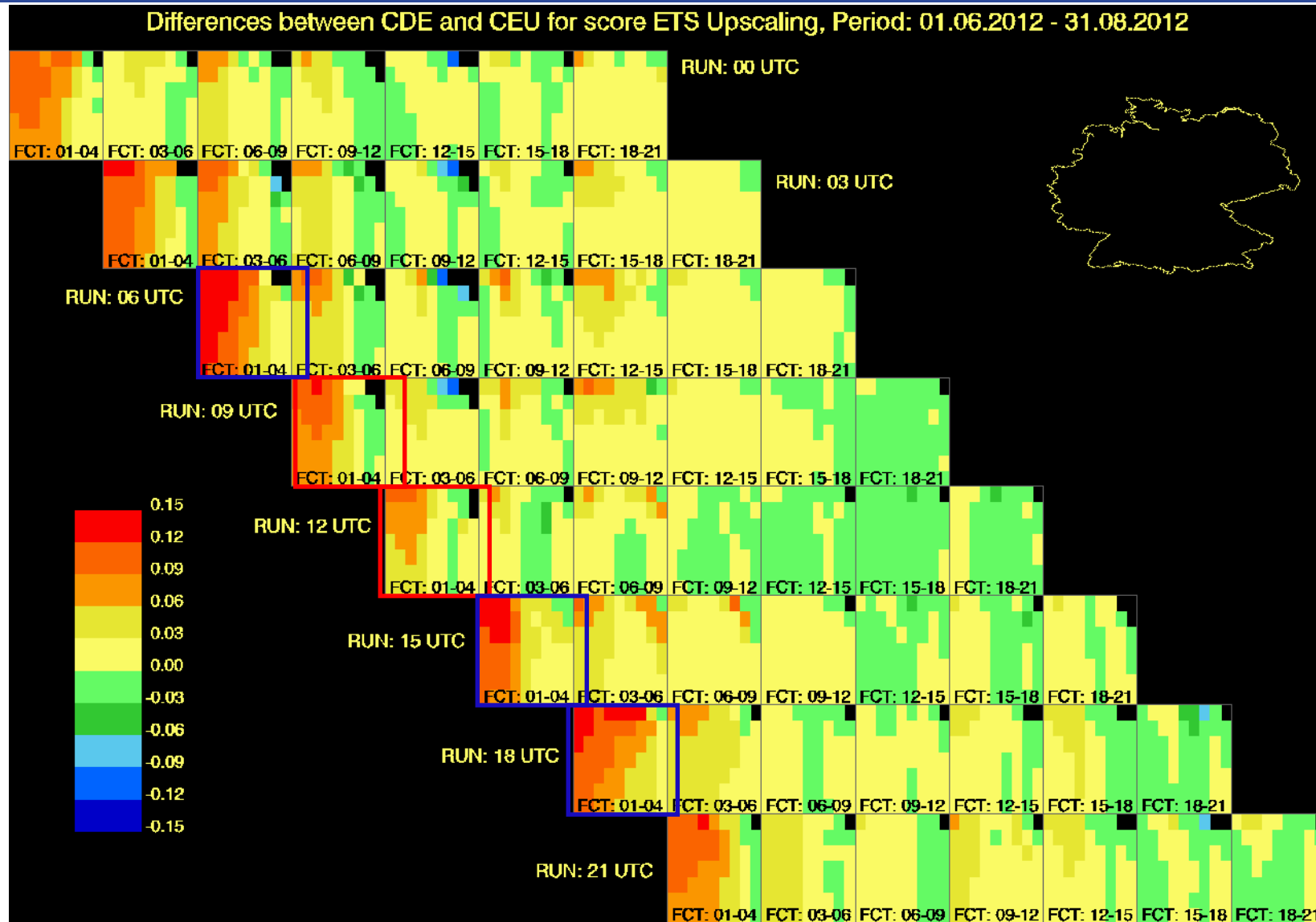
WCG5

Presentation of Fuzzy-verification results

- Look at windows with different horizontal size
- Calculate scores that are representative for these windows



CEU + CDE: Fuzzy-Precipitation verification, Summer 2012



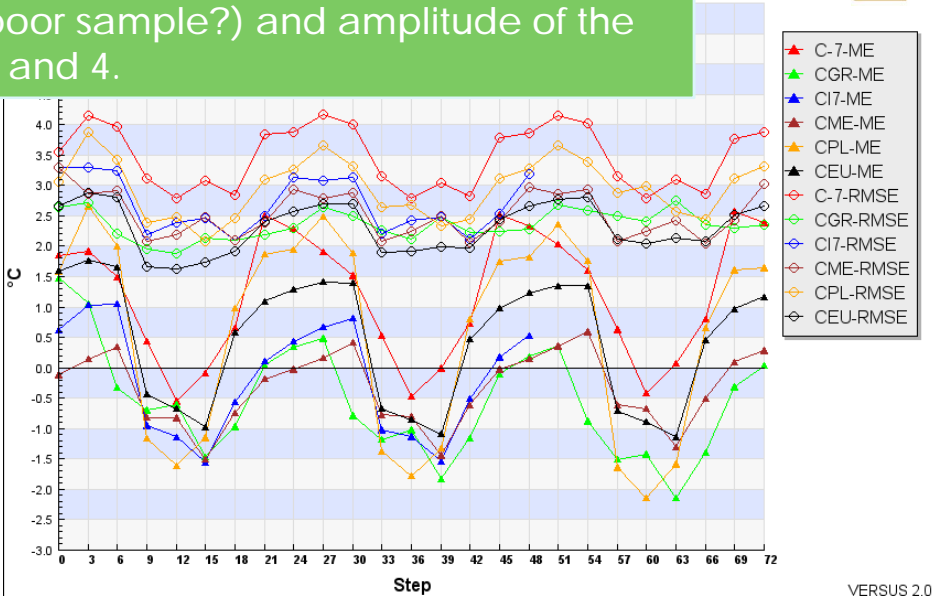
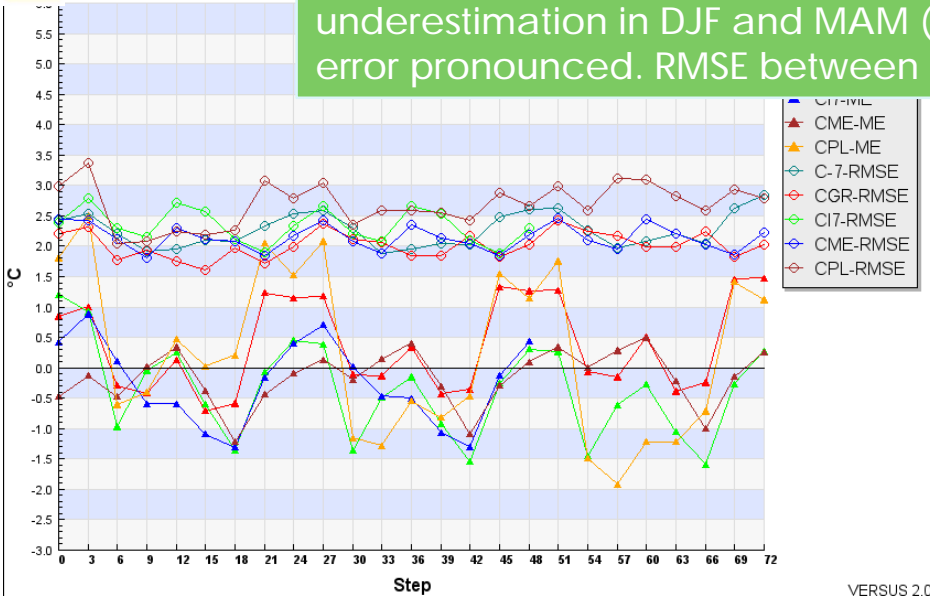
Conditional Verification (Task 1.2)

WCG5

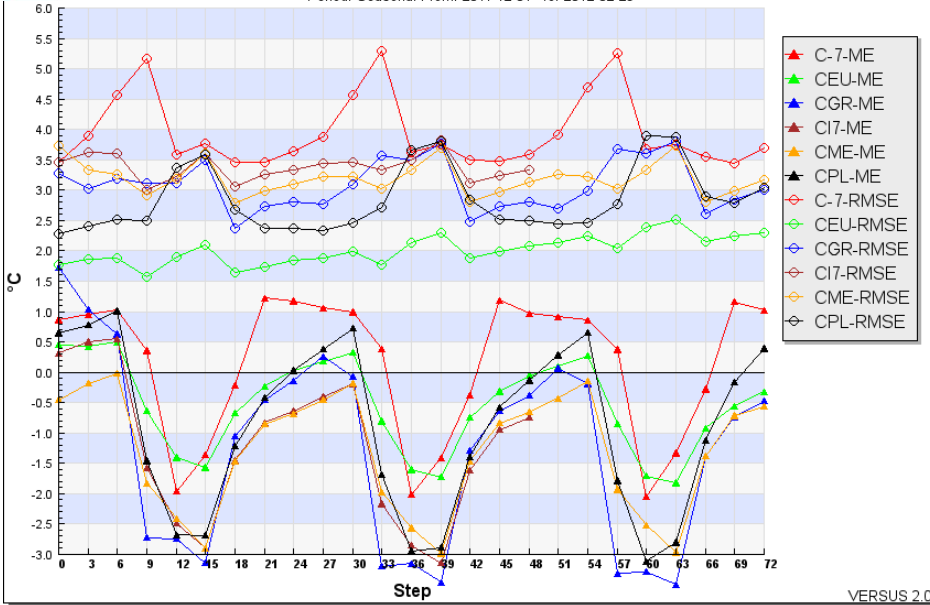
2MT in Sky Clear conditions - JJA 2011 – MAM 2012



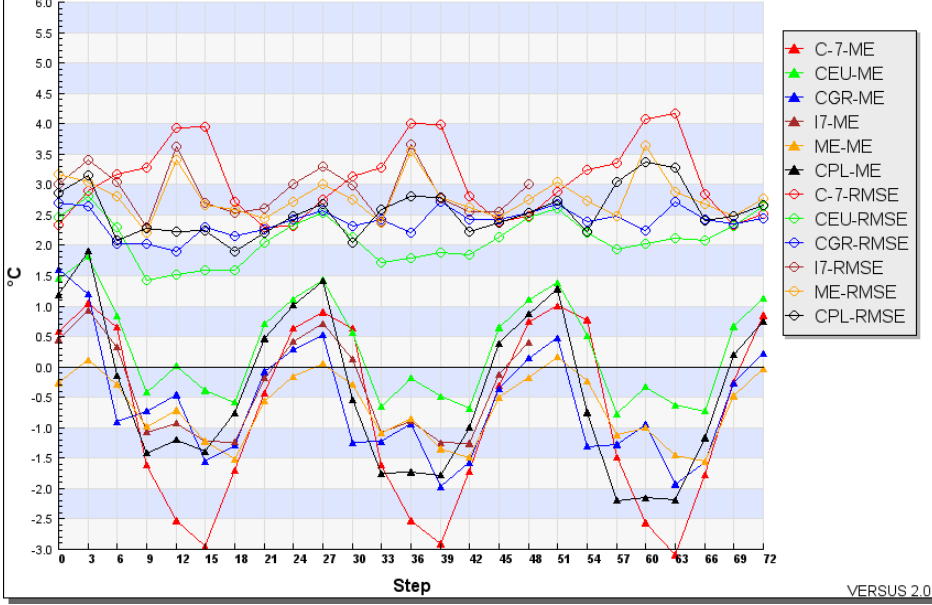
Clear diurnal cycle for all the models with a general tendency to underestimation in DJF and MAM (poor sample?) and amplitude of the error pronounced. RMSE between 2 and 4.



Cross-Model: T2m - TCC less than 25
Period: Seasonal From: 2011-12-01 To: 2012-02-29



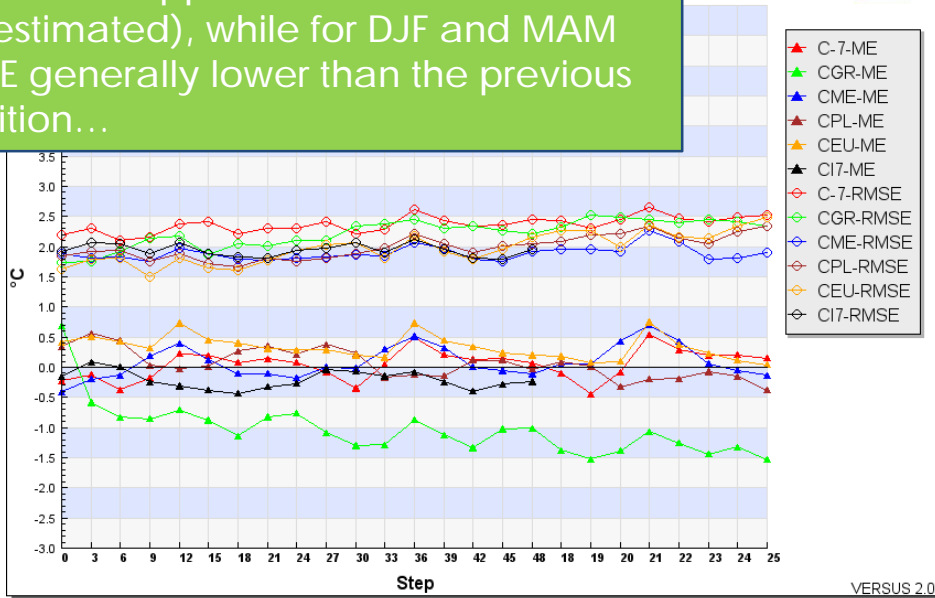
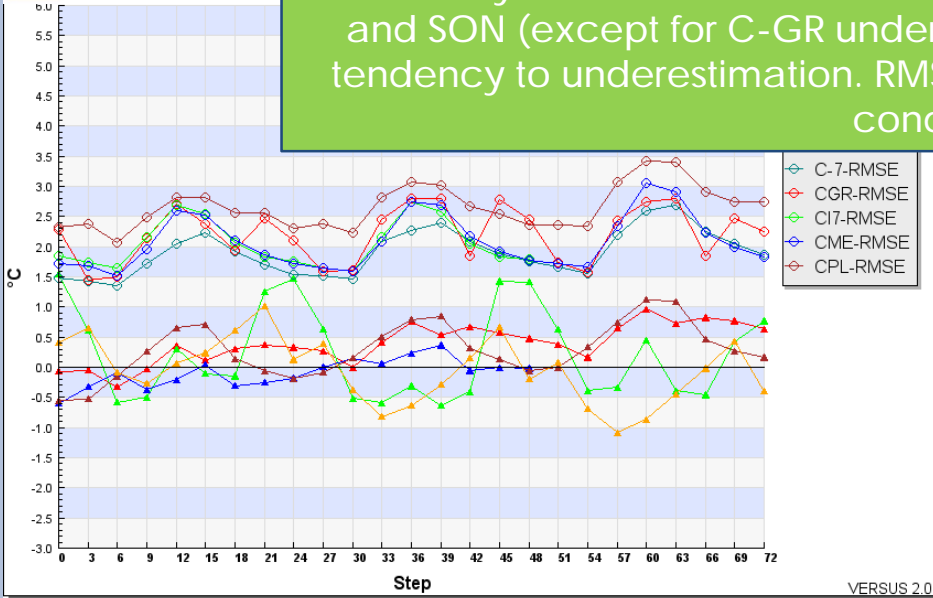
Cross-Model: T2m - TCC less than 25
Period: Seasonal From: 2012-03-01 To: 2012-05-31



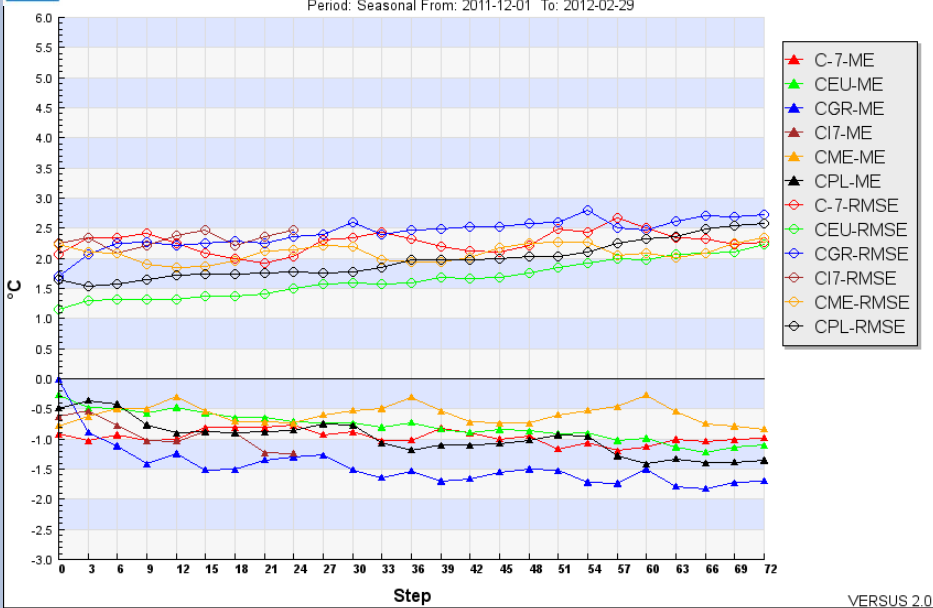
2MT IN OVERCAST CONDITIONS - JJA 2011 – MAM 2012



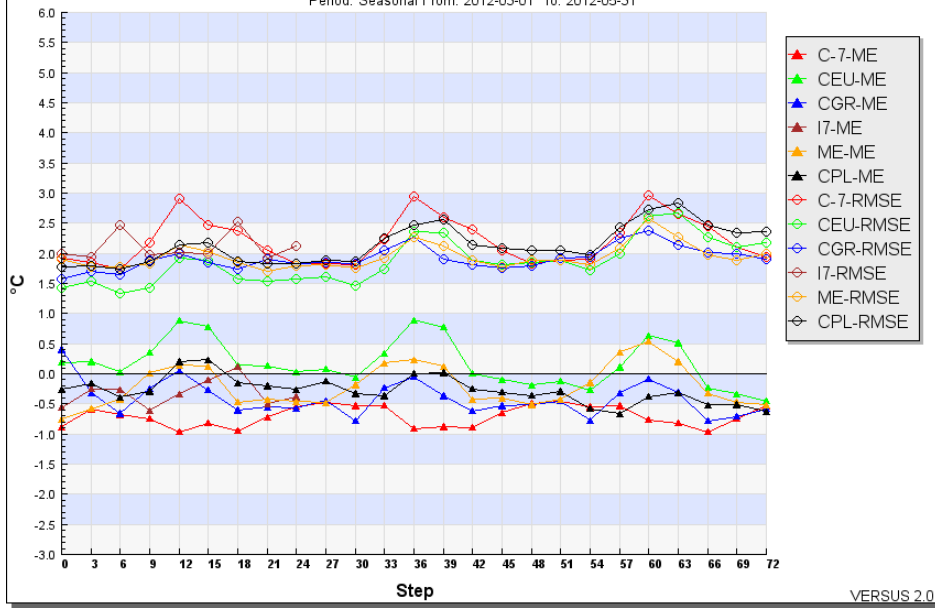
Diurnal cycle for all the models almost disappear. Me is around 0 JJA and SON (except for C-GR underestimated), while for DJF and MAM tendency to underestimation. RMSE generally lower than the previous condition...



Cross-Model: T2m - TCC greater than 75
Period: Seasonal From: 2011-12-01 To: 2012-02-29



Cross-Model: T2m - TCC greater than 75
Period: Seasonal From: 2012-03-01 To: 2012-05-31



Thank you – Ευχαριστώ

WCG5