



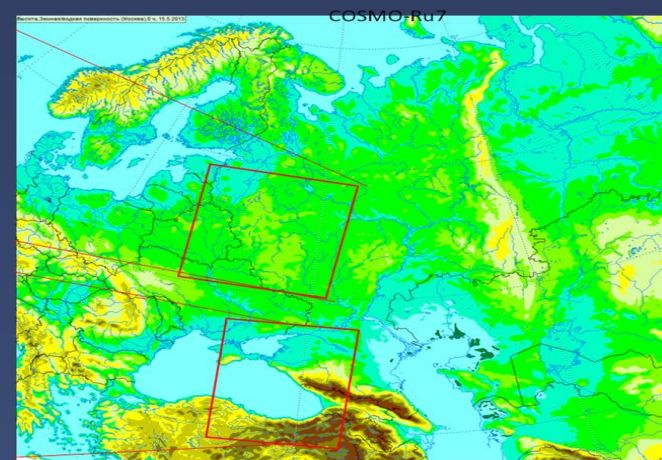
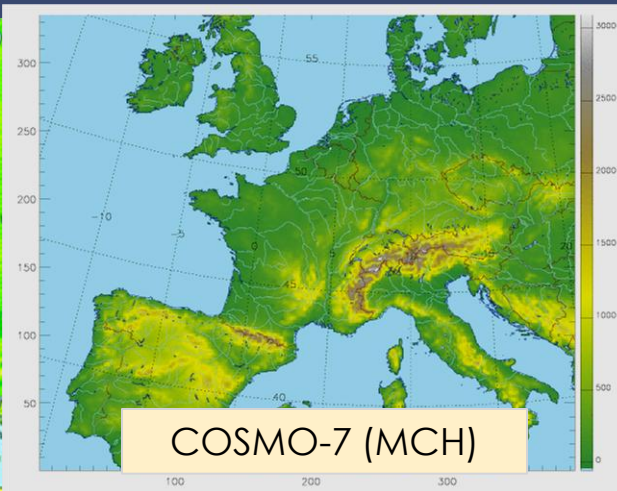
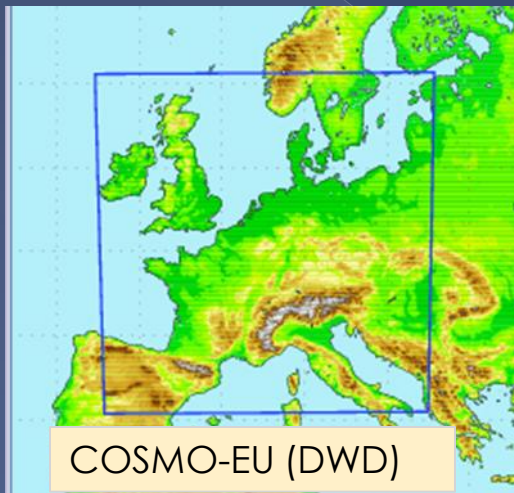
WG5: Common Plot Reports

WG5

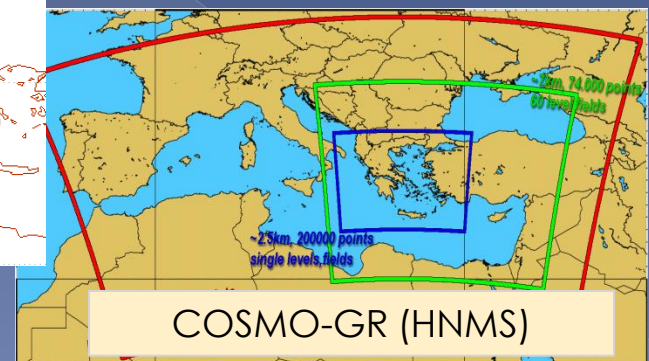
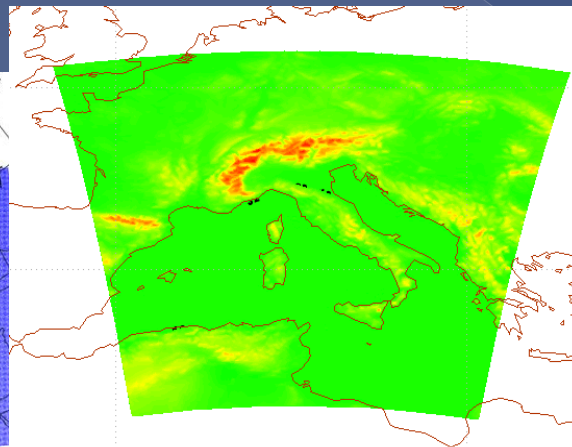
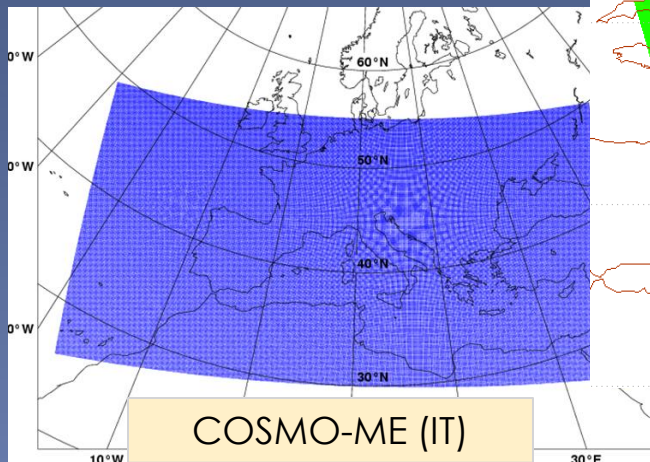
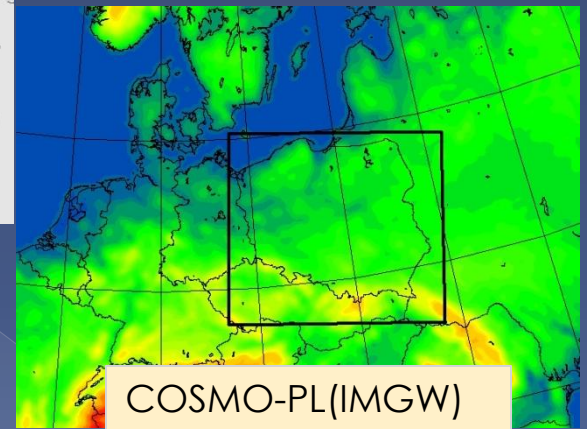
Dimitra Boucouvala & WG5

MGR

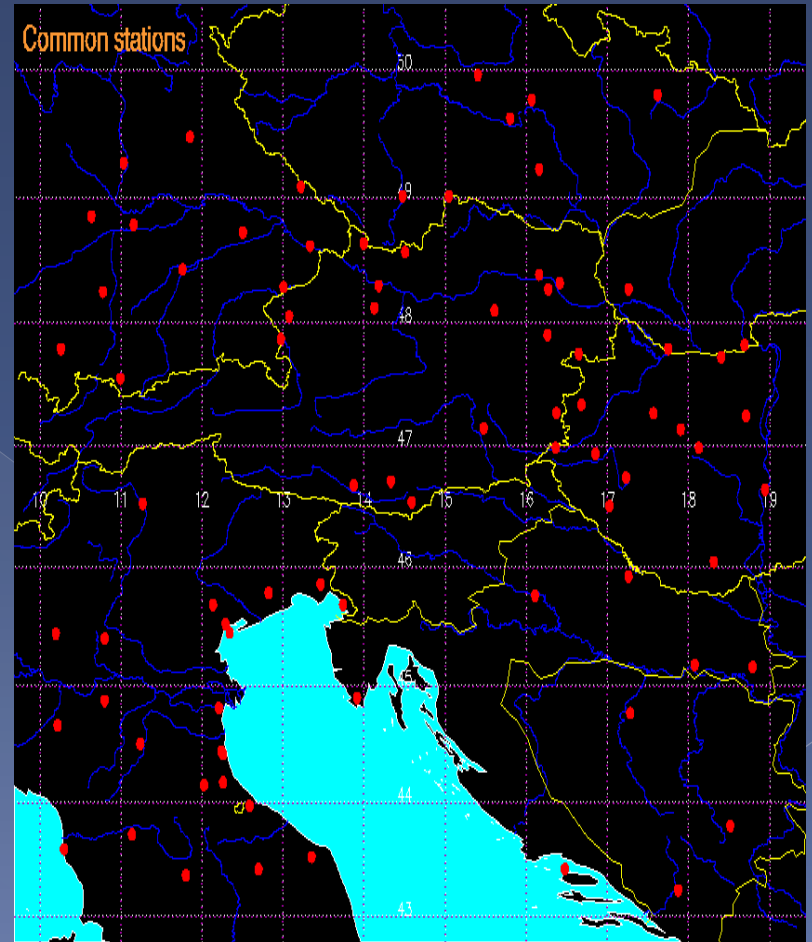
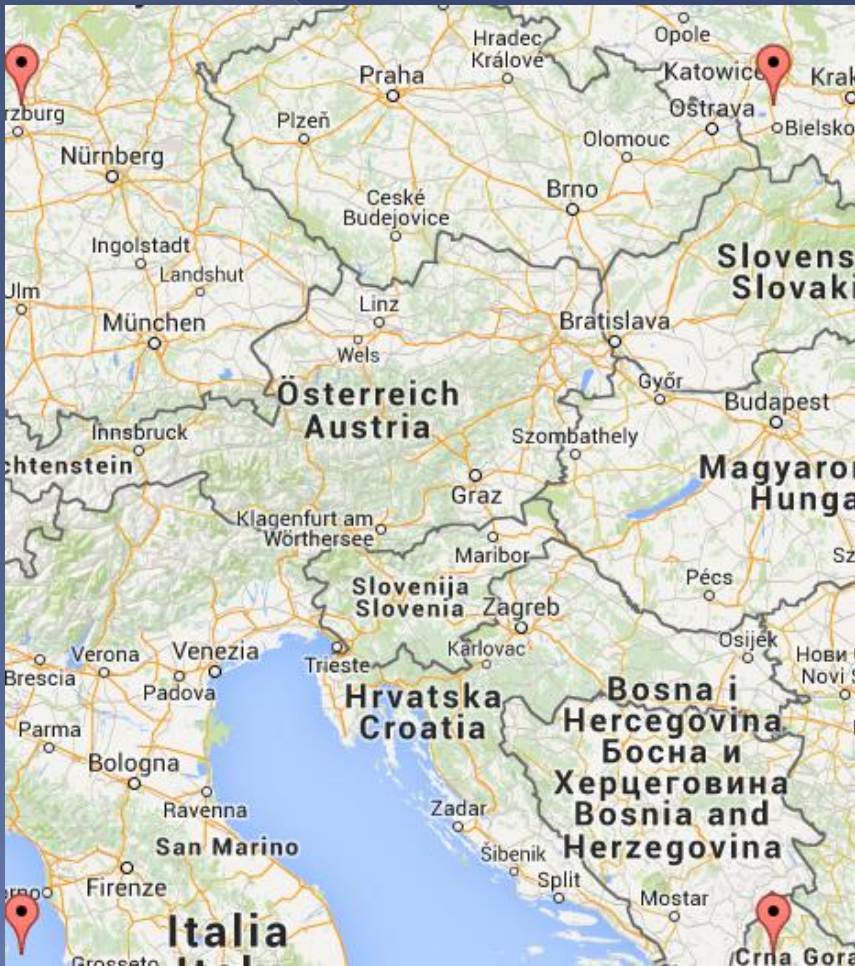
THE COSMO MODELS



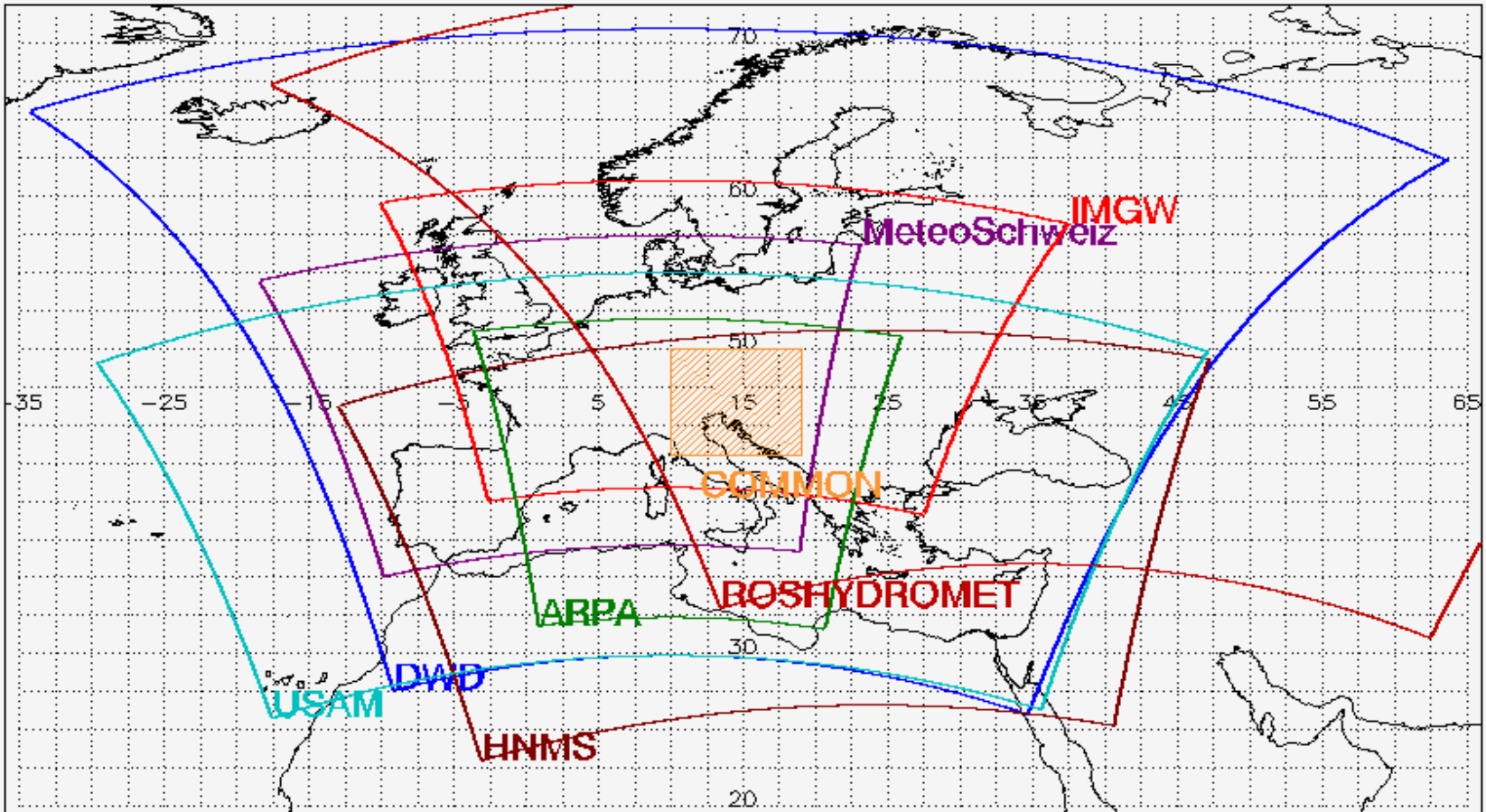
COSMO-RU7(RHM)



Common Area (92 stations)



Standard Verification on Common Area- COSMO models and IFS-ECMWF



Standard Verification on Common Area

- Period: JJA 2014, SON 2014, DJF 2014/2015, MAM 2015
- Run: 00 UTC run
- Continuous parameters - T2m, Td2m, Mslp, Wspeed, (3D method height optimized) TCC (30km radius method), TCC IFS (nearest neighbour method)
 - > Scores : ME, RMSE
 - > Forecasts Step: every 3 hours
- **Dichotomous parameters – Precipitation (15km radius method):**
 - > Scores: FBI-POD-FAR-TS with Performance Diagram
 - > Cumulating: 6h and 24h
 - > Thresholds: 0.2, 0.4, 0.6, 0.8, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20 mm/6h and mm/24h

Conditional Verification on Common Area (All seasons)

- 2mT verification with the following conditions (based on forecasts):
 - > Soil Water Content $\geq 4 \text{ g/m}^2$ (MOIST condition)
 - > Soil Water Content $< 2 \text{ g/m}^2$ (DRY condition)
- Wind speed verification with the following conditions (based on forecasts):
 - > Roughness length $\geq 1 \text{ m}$ (ROUGH cases))
 - > Roughness length $< 0.2 \text{ m}$ (SMOOTH cases)

Conditional Verification on Common Area (DJF-MAM)

Subgrid Scale Orography test effect (Cerenzia et al.)

- ◎ 2mT, Wind speed, MSLP Verification with the following SSO STDH (Subgrid Scale orography variance) conditions:
 - > SSO STDH <25 (condition based on forecasts)
 - > SSO STDH >= 100 (condition based on forecasts)



Standard Verification HR on Various Domains **NEW!**

- ⦿ Period: JJA 2014, SON 2014, DJF 2014/2015, MAM 2015
- ⦿ Run: 00 UTC run

- ⦿ Continuous parameters - T2m, Td2m, Mslp, Wspeed, (3 D method height optimized) TCC (30km radius method)
 - > Scores : ME, RMSE
 - > Forecasts Step: every 3 hours

- ⦿ Dichotomic parameters – Precipitation (15km radius method):
 - > Scores: FBI-POD-FAR-TS with Performance Diagram
 - > Cumulating: 6h and 24h
 - > Thresholds: 0.2, 0.4, 0.6, 0.8, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, 20 mm/6h and mm/24h

SOME POINTS ABOUT COMMON PLOTS TASK:

- The purpose of these plots is to see the overall performance of COSMO model
- Relative comparison is not evident because models are different in many aspects (domain, ic/bc, assimilation cycle, model version, physics parameterization), even if they are tested in the same domain.

COSMO 7km models used for Common Area

	DWD	MCH	USAM	ARPA-SIMC	HNMS	IMGW	RHM
	C-EU	C-7	C-ME	C-I7	C-GR	C-PL	C-RU
Model Version	4.18-4.19	4.12+4.19	5.0	4.28	5.0	4.08	5.00
Driving Model	GME/ICON	IFS	IFS	IFS	IFS	GME/ICON	GME/ICON
Soil Moisture Analysis	yes	no	no	no	no	no	no
Ass/tion cycle	yes	yes	no	Yes	no	yes	No/Yes
TKESSO	-	yes	yes	yes	no	no	no

GME models switched to ICON in DJF season, Data assimilation cycle Was introduced for C-RU



COSMO HR models used for Various Domains

	DWD	USAM	HNMS	RHM	ARPA-SIMC
	C-DE	C-IT	C-GR	C-RU2	C-I2
Model Version	4.19	5.0	5.0	5.0	5.0
Resolution	~3km	2.8km	~3km		
Lateral BC	C-EU	C-ME	C-GR	C-RU	C-I7
N.Stations	250	~100	~50		
LBC Update	1h	1h	3h	1h	1h
Initial State	nudging	nudging	nudging	nudging	nudging
External Analysis	SST, snow depth	none	none	none	none
Initialization	none	none	none	none	none
Forecast Range	21h	24h	48h	24h	24h

SOME POINTS/PROBLEMS ABOUT COMMON PLOTS TASK:

Members :

- ⦿ Did not deliver the data on time, sometimes too late, after the report was finished
- ⦿ Did not perform all the CP Conditional Verifications / HR data
- ⦿ Did not send a short report, and if so, it was mostly descriptive
- ⦿ Many times the data was wrong, or with suspect values peaks. The data was not plotted before being sent.
- ⦿ GME data was not delivered
- ⦿ The files sometimes had inappropriate filenames, contained extra scores and more hours, therefore they needed extra processing.
- ⦿ Result: Delays for report preparation, extra work to plot again the data, update the reports, no time to analyze better the results and perform more plots
- ⦿ No particular interest for the reports that were not carefully or not at all read by WG5.

Summer 2014 (JJA)

MODEL	CP-UNCD	CND- W	CND-T	VD-HR
C-GR	YES	YES	NO	YES (48h)
C-EU/DE	YES	NO	NO	YES (21h)
C-7	YES	YES	YES	NO
C-PL	YES	NO	YES	NO
C-RU7/RU2	YES	NO	NO	NO
C-ME/IT	YES	YES	YES	YES (24h)
C-I7/I2	YES	YES	YES	NO
ECMWF-IFS	YES	YES	NO	-
GME	NO	NO	NO	-

Fall 2014 (SON)

MODEL	CP-UNCD	CND-W	CND-T	VD-HR
C-GR	YES	YES	YES	YES (48h)
C-EU/DE	YES	NO	NO	YES (21h)
C-7	YES	YES	YES	NO
C-PL	YES	YES	YES	NO
C-RU7/RU2	YES	NO	YES	YES (24h)
C-ME/IT	YES	YES	YES	YES (24h)
C-I7/I2	YES	YES	YES	NO
ECMWF-IFS	YES	YES	NO	-
GME	NO	NO	NO	-

Winter 2014-2015 (DJF)

MODEL	CP-UNCD	CND-W	CND-T	CND-SSO	VD-HR
C-GR	YES	YES	YES	YES	YES (48h)
C-EU/DE	YES	NO	NO	NO	YES (21h)
C-7	YES	YES	YES	YES	NO
C-PL	YES	YES	YES	YES	NO
C-RU7/RU2	YES	NO	YES	YES	YES (24h)
C-ME/IT	YES	YES	YES	YES	YES (24h)
C-I7/I2	YES	YES	YES	YES	YES (24h)
ECMWF-IFS	YES	YES	NO	-	-
GME	NO	NO	NO	-	-

Spring 2015 (MAM)

MODEL	CP-UNCD	CND-W	CND-T	CND-SSO	VD-HR
C-GR	YES	YES	YES	YES	YES (48h)
C-EU/DE	YES	NO	NO	NO	YES (21h)
C-7	YES	YES	YES	YES	NO
C-PL	YES	YES	YES	YES	NO
C-RU7/RU2	YES	NO	YES	NO	NO
C-ME/IT	YES	YES	YES	YES	NO
C-I7/I2	YES	YES	YES	YES	YES (24h)
C-I7-LEPS	YES	NO	NO	YES	NO
ECMWF-IFS	YES	YES	NO	-	-
GME	NO	NO	NO	-	

Weather elements for ComA

NEW!

JJA : above average warm and dry- convective precipitation

SON: alteration of warm and dry regime- days with rainfall

DJF : Mild winter with cooler days and rain the second half

MAM: alteration of warm and dry regime- days with rainfall

Generally temperatures above average.

To follow the presentation have a look at the colors of each country and locate your own !!

C-GR

IFS

C-PL

C-ME

C-RU

C-7

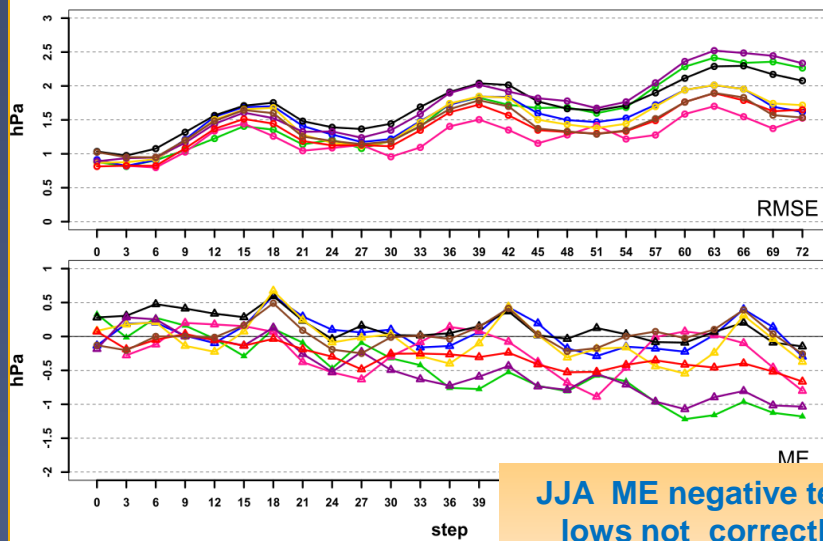
C-17

C-EU

Continuous parameters

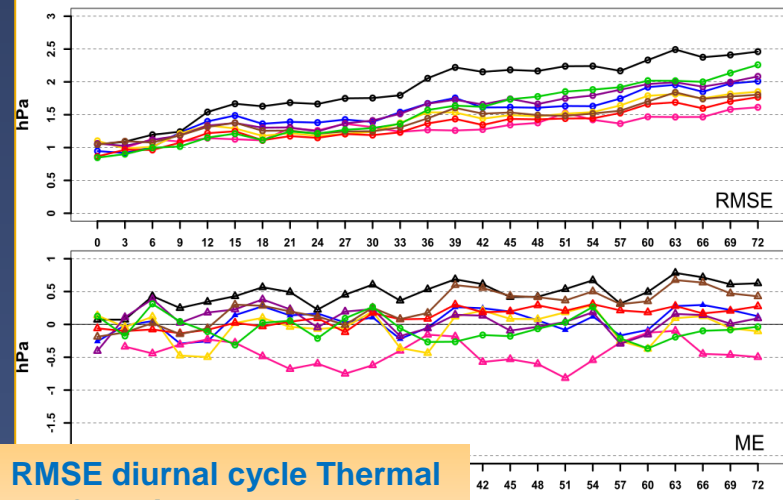
MSLP

Mean Sea Level Pressure, JJA 2014, Common area, All stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

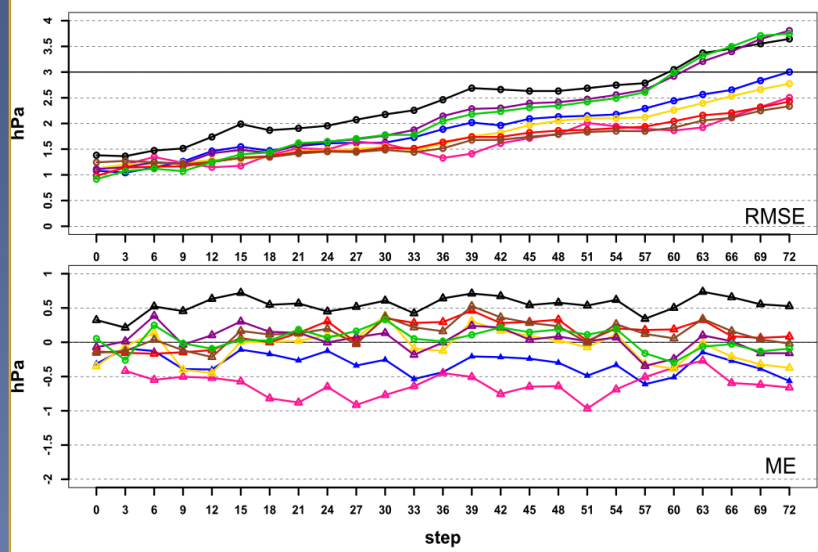
Mean Sea Level Pressure, SON 2014, Common area, All stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU

JJA ME negative tendency. RMSE diurnal cycle Thermal lows not correctly simulated? ME in other seasons dispersed. RMSE increasing with time faster in DJF. Overestimation for C-PL for IFS stays negative

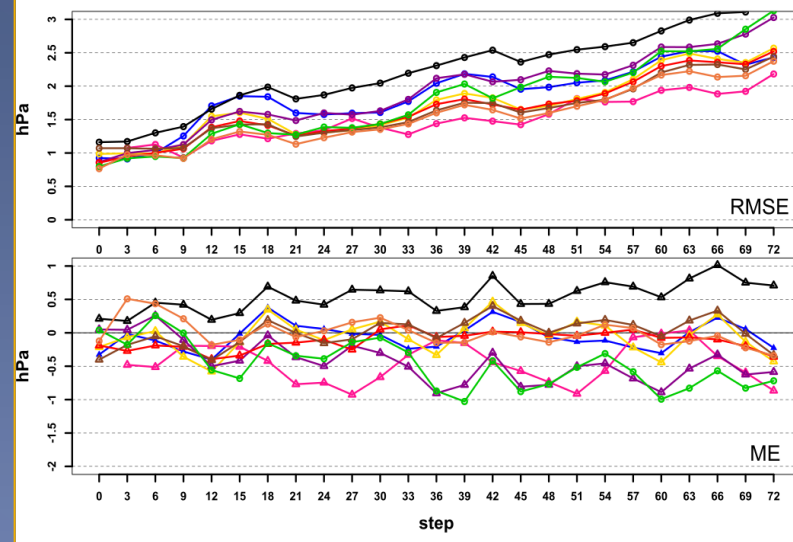
Mean Sea Level Pressure, DJF 2014-2015, Common area, All stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU



Mean Sea Level Pressure, MAM 2015, Common area, All stations

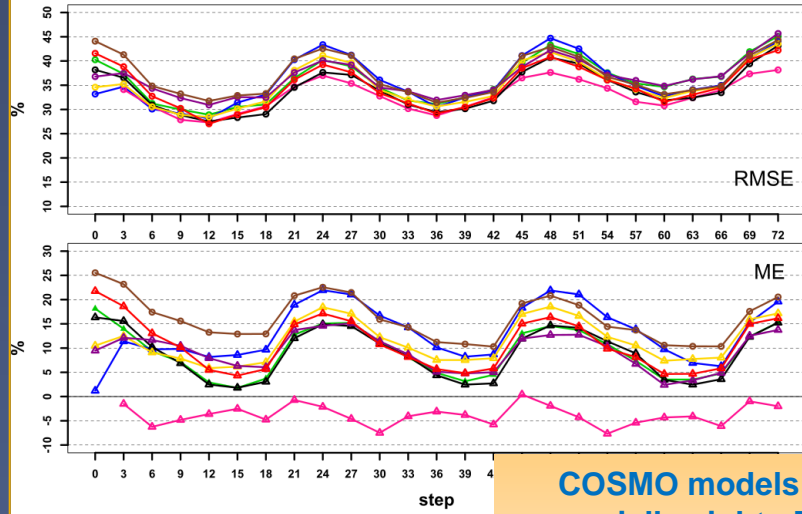


- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU
- I7-LEPS



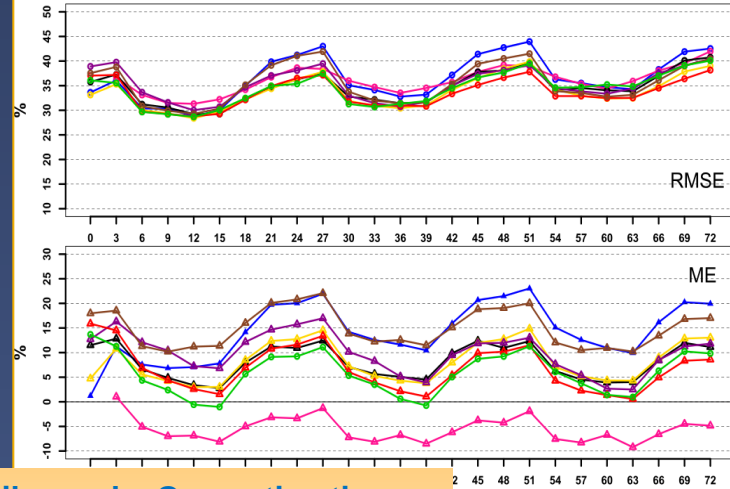
Total Cloud Cover

Total Cloud Cover, JJA 2014, Common area, All stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

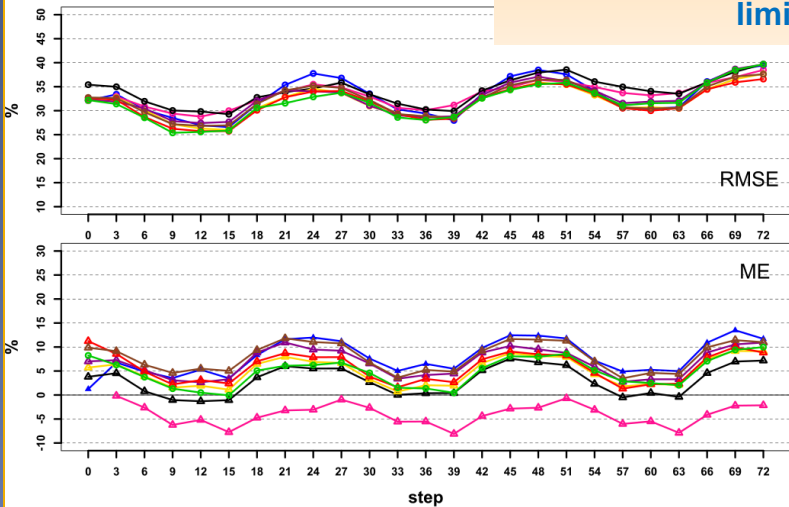
Total Cloud Cover, SON 2014, Common area, All stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU

COSMO models follow similar cycle. Overestimation especially night. More convergence and smoother cycle in DJF. Max error 00 UTC SON 03. IFS almost constant underestimation. Slightly bigger errors for C-GR C-I7. ME >0 can be a cause for T overestimation at night (Note: limited cases in the summer)

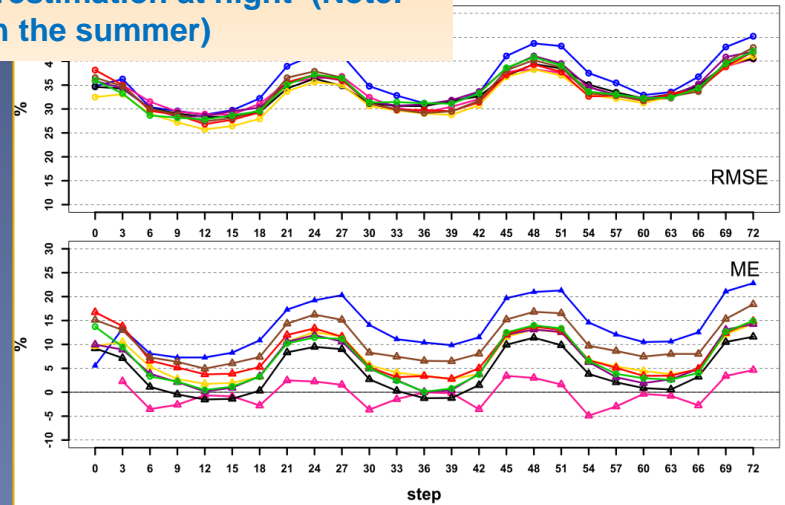
Total Cloud Cover, DJF 2014-2015, Common area, All stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU



Total Cloud Cover, DJF 2014-2015, Common area, All stations

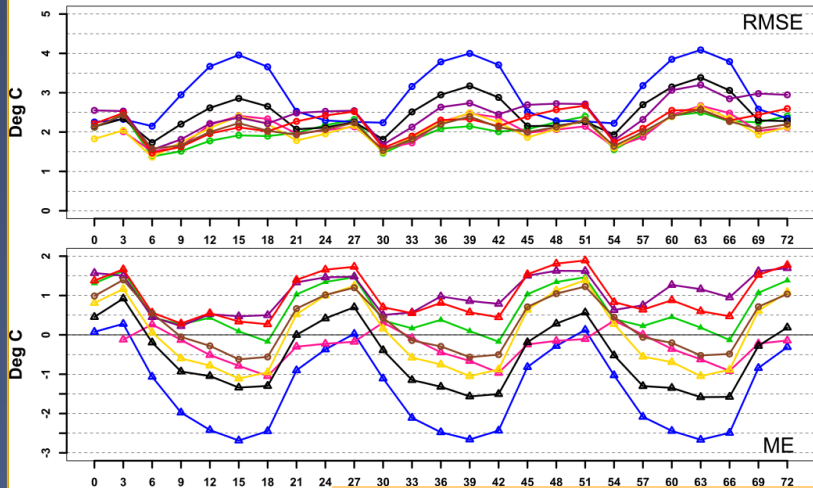


- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU



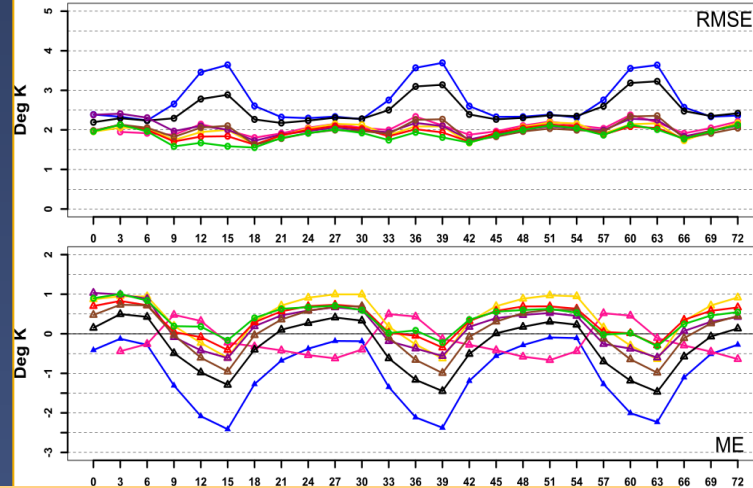
Temperature 2m

Temperature 2m, JJA 2014, Common area, All stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

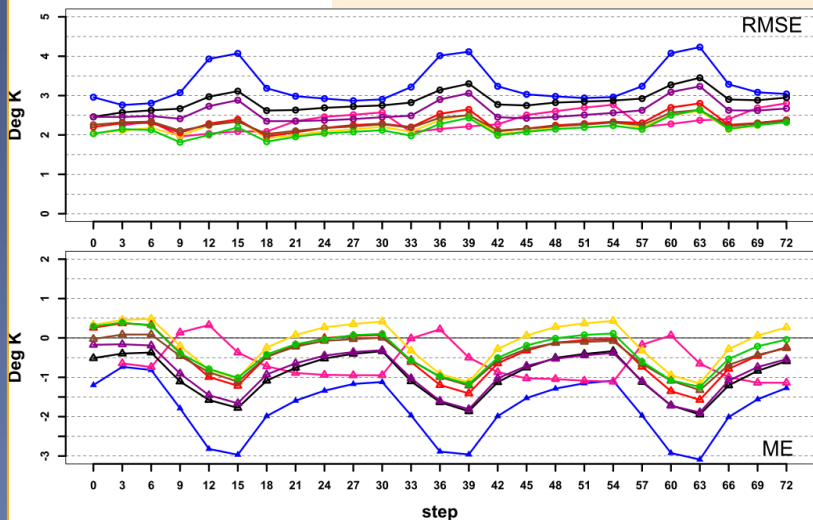
Temperature 2m, SON 2014, Common area, All stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU

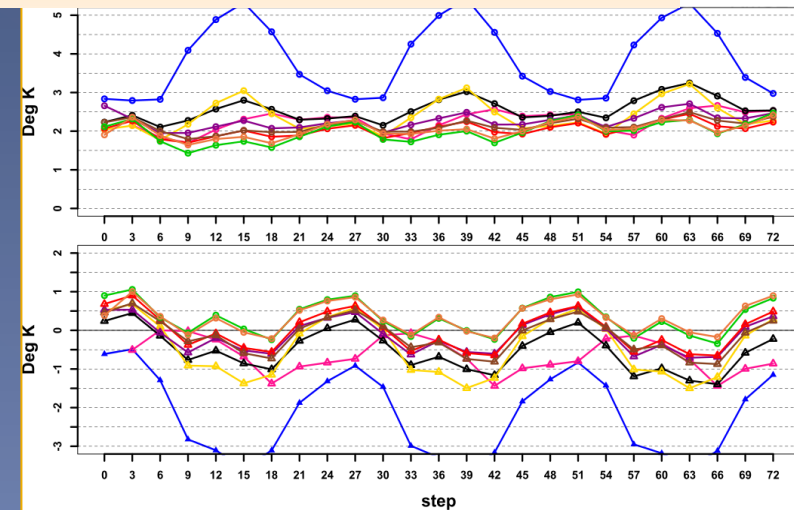
Clear diurnal ME cycle with positive tendency at night and negative in the day .JJA more divergence with 3 models overestimating in the day. C-GR worse results especially MAM due to change of terrain parameters All COSMO models underestimate T in the winter even at night (warm winter ?). IFS hysteresis (also TCC different)

Temperature 2m, D...



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU

s

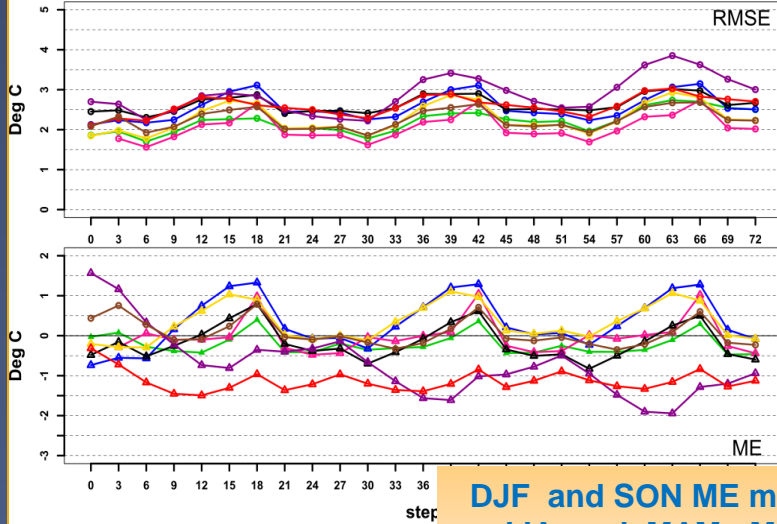


- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- I7 LEPS
- C-EU



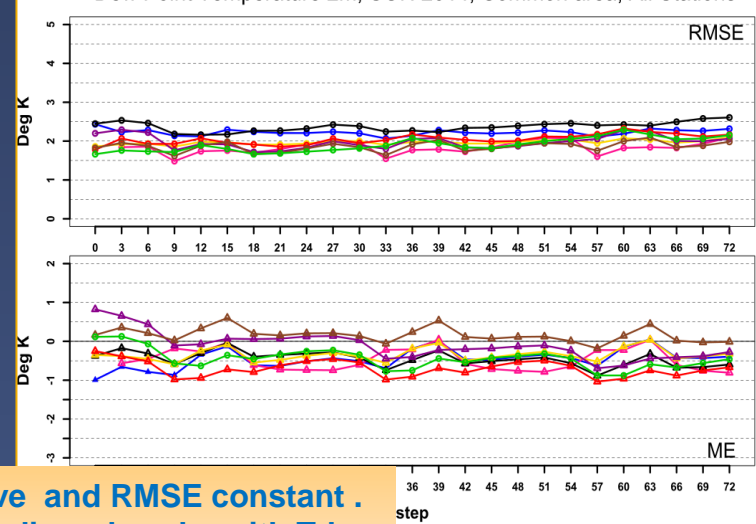
T DEW 2m

Dew Point Temperature 2m, JJA 2014, Common area, All Stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

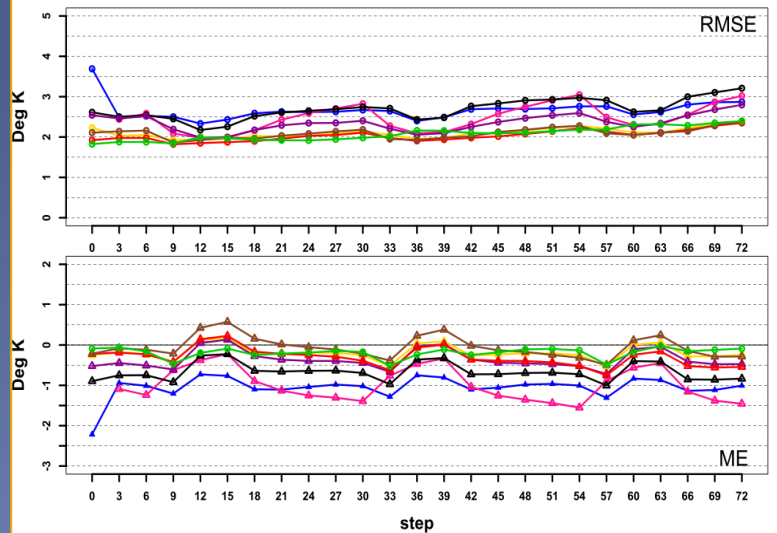
Dew Point Temperature 2m, SON 2014, Common area, All Stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU

**DJF and SON ME mostly negative and RMSE constant .
JJA and MAM, ME and RMSE diurnal cycle, with Td overestimation in the afternoon . C-7, C-RU constant underestimation in JJA .**

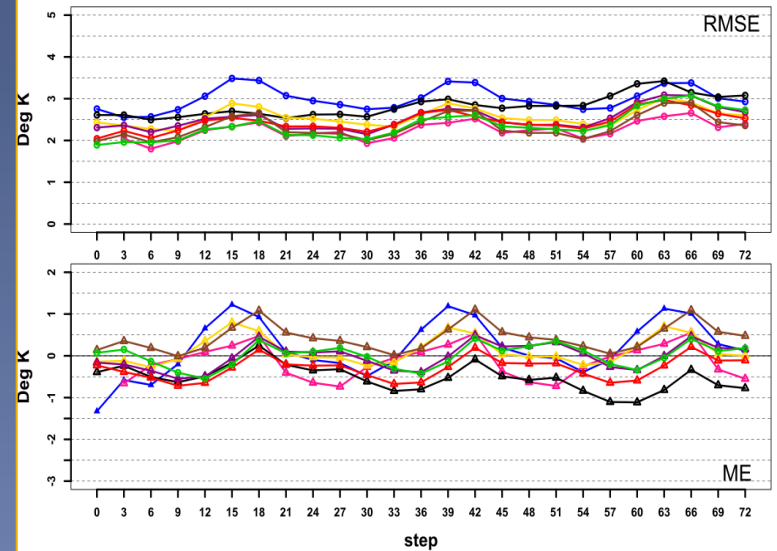
Dew Point Temperature 2m, DJF 2014-2015, Common area, All Stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU



Dew Point Temperature 2m, MAM 2015, Common area, All Stations

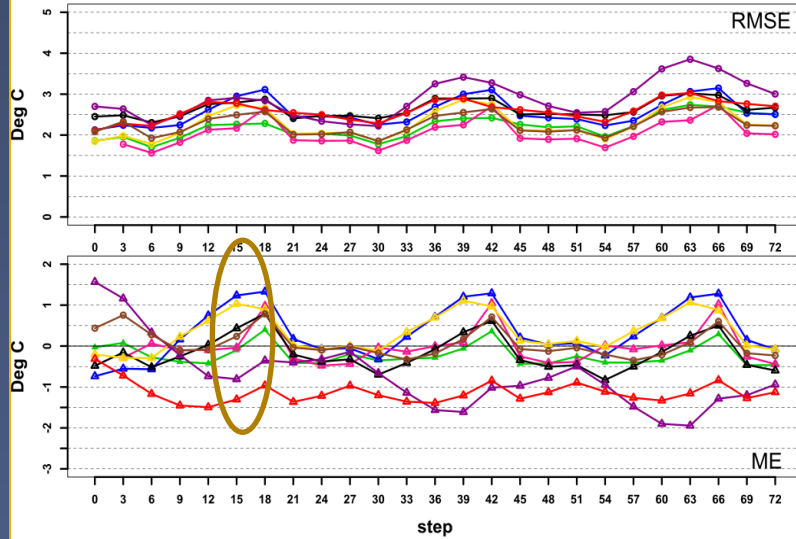


- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU





Dew Point Temperature 2m, JJA 2014, Common area, All Stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

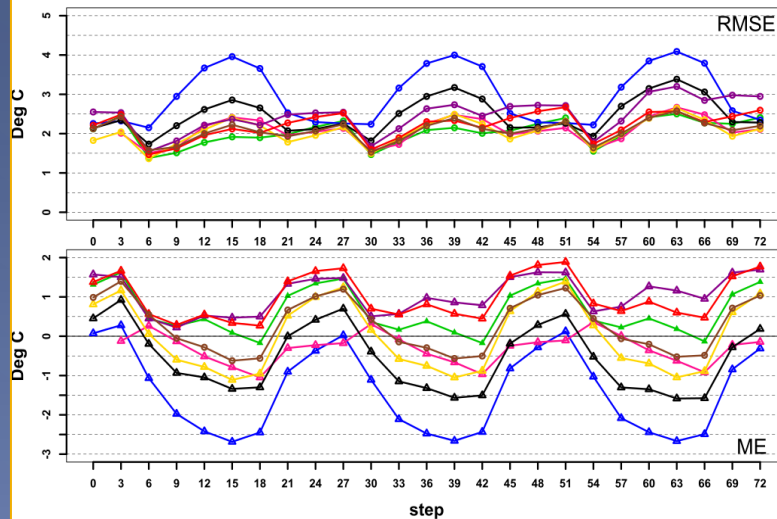
Some thoughts for Summer day

Predicted Cooler T – Warmer Td

Results more humid modeled condition
C-7, C-RU opposite behaviors

predicting drier conditions

Temperature 2m, JJA 2014, Common area, All stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

C-GR

IFS

C-PL

C-ME

C-RU

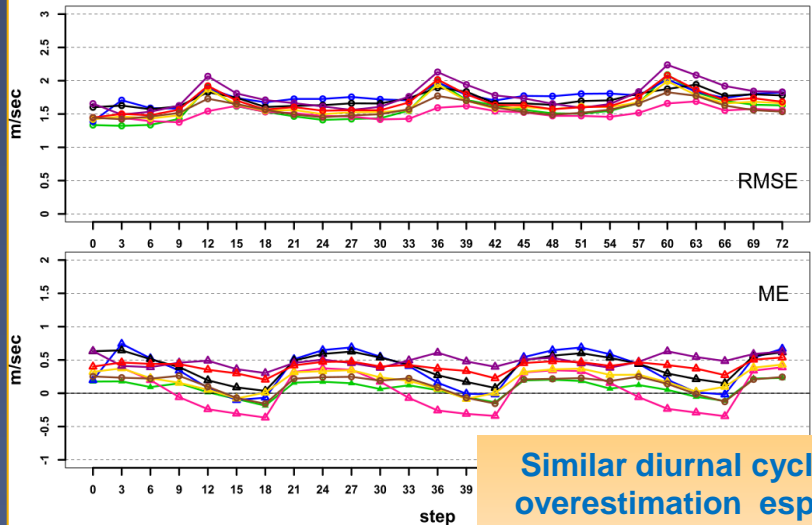
C-7

C-I7

C-EU

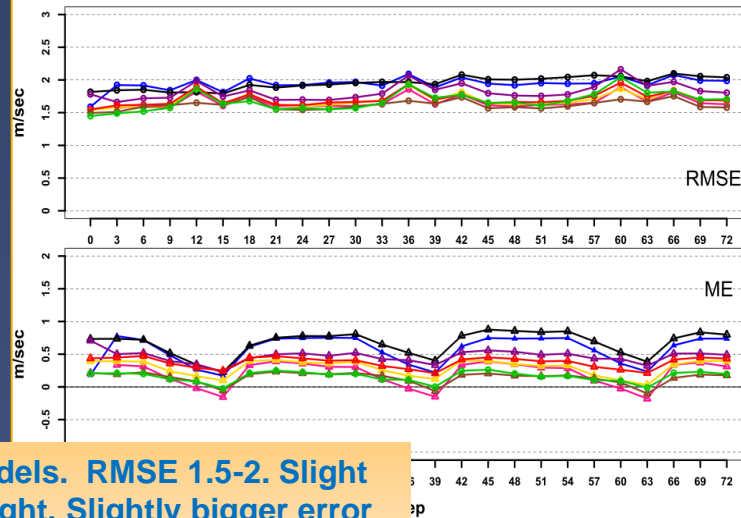
WIND SPEED 10m

Wind Speed 10m, JJA 2014, Common area, All Stations



- C-EU
- C-GR
- C-IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7

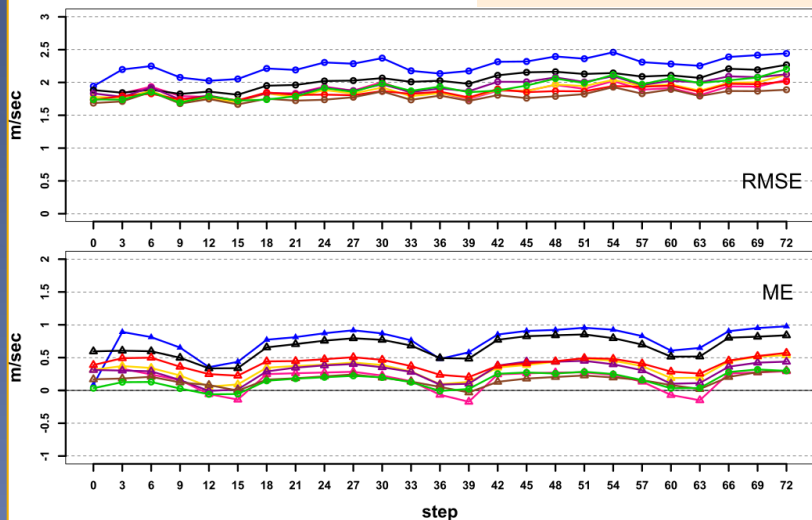
Wind Speed 10m, SON 2014, Common area, All Stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU

Similar diurnal cycle for all models. RMSE 1.5-2. Slight overestimation especially at night. Slightly bigger error for C-PL, C-GR. Peaks can be related to pressure errors in JJA? Mixing at night can cause T overestimation? Error drops in the afternoon in all variables (NBL?)

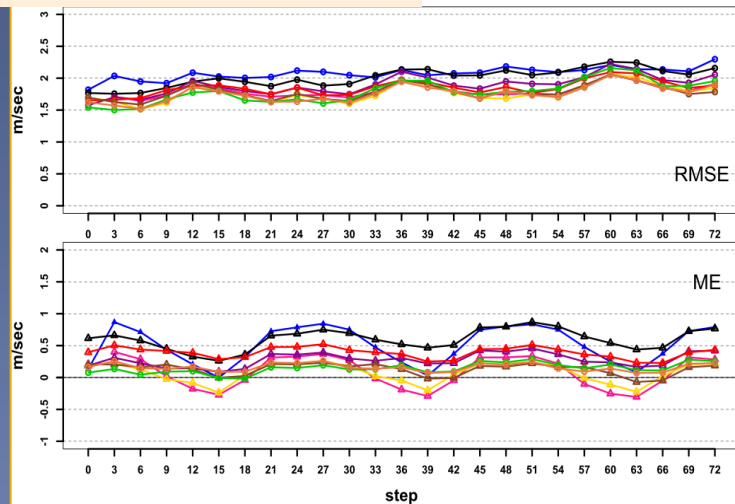
Wind Speed 10m, DJF 2014-2015, Common area, All Stations



- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU



Wind Speed 10m, MAM 2014, Common area, All Stations



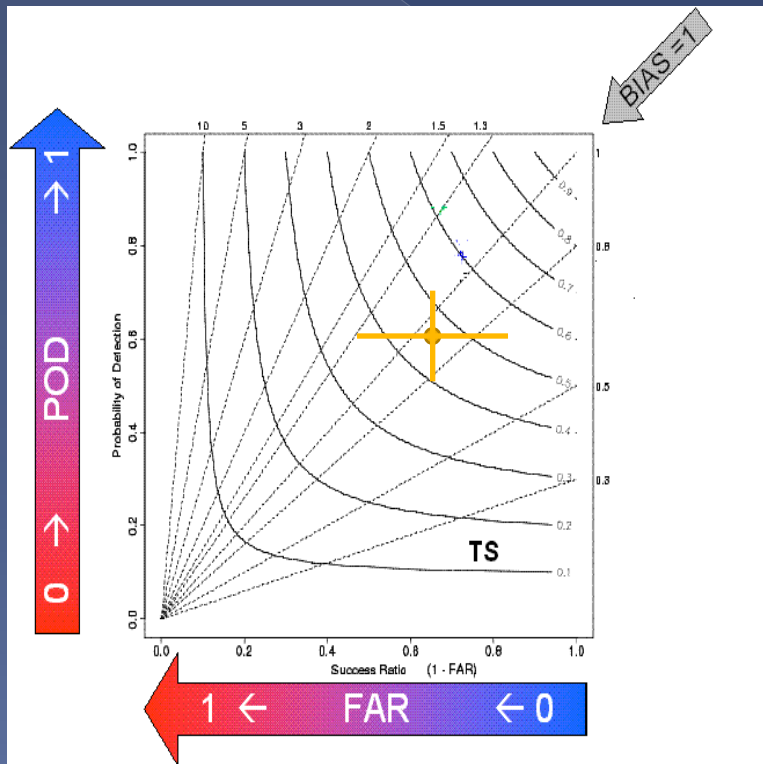
- C-GR
- IFS
- C-PL
- C-ME
- C-RU
- C-7
- C-I7
- C-EU
- I7-LEPS



Dichotomous parameters:

Precipitation
Cumulating Periods 6h/24h

Performance diagram

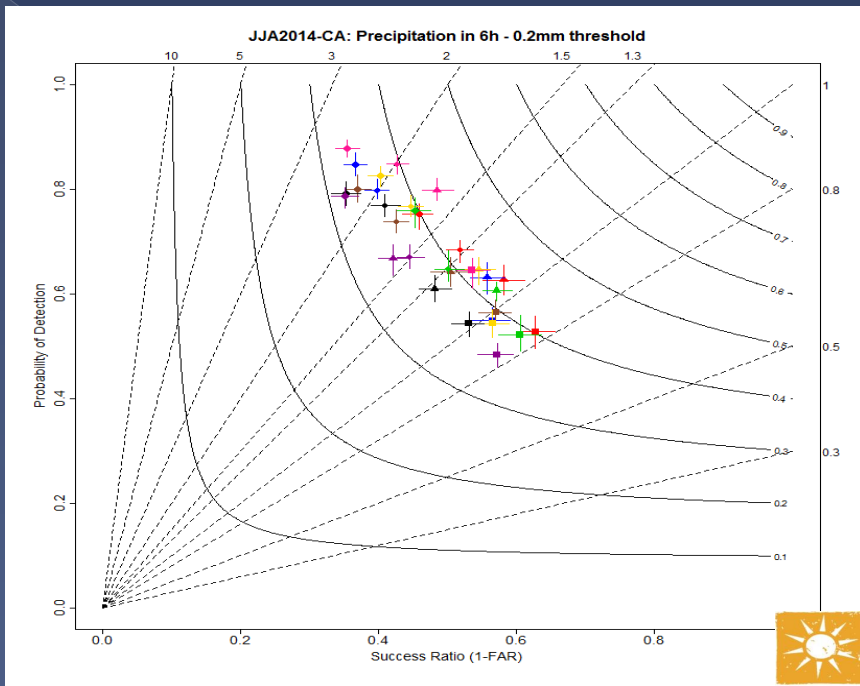


- In the graph is exploited the geometric relationship between four measures of dichotomous forecast performance:
 - probability of detection (POD)
 - success ratio (SR, defined as $1 - \text{FAR}$)
 - bias score (BS)
 - threat score (TS, also known as the Critical Success Index).
- For good forecasts, 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 data (from the contingency table).
 - The bars represent the 95th percentile range for SR and POD.

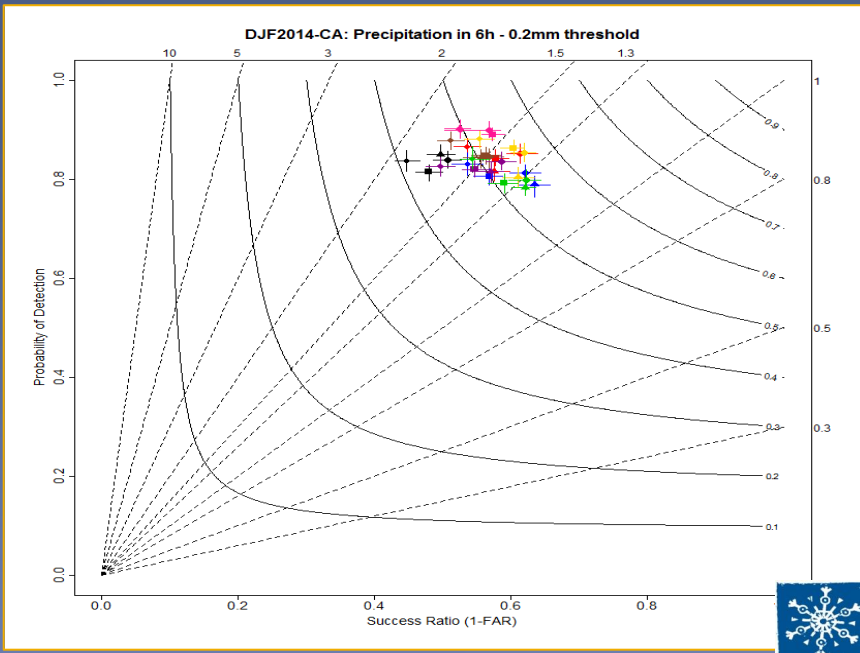
Cumulation period: 6/24 h

- For the 6h cumulation period the hour represents :
 - (6h) + 0h to +6h
 - (12h) + 6h to +12h
 - (18h)+ 12h to +18h
 - (24h)+ 18h to +24h
- Main Reference thresholds
 - 0.2 mm
 - 2 mm
 - 5mm
 - 10 mm

JJA and DJF different : JJA clear FBI diurnal cycle with overestimation in all times especially 18h, but with underestimation at 24h. Convective afternoon precipitation overestimated but not evening showers. DJF models grouped together with FBI >1 for all times with better TS.



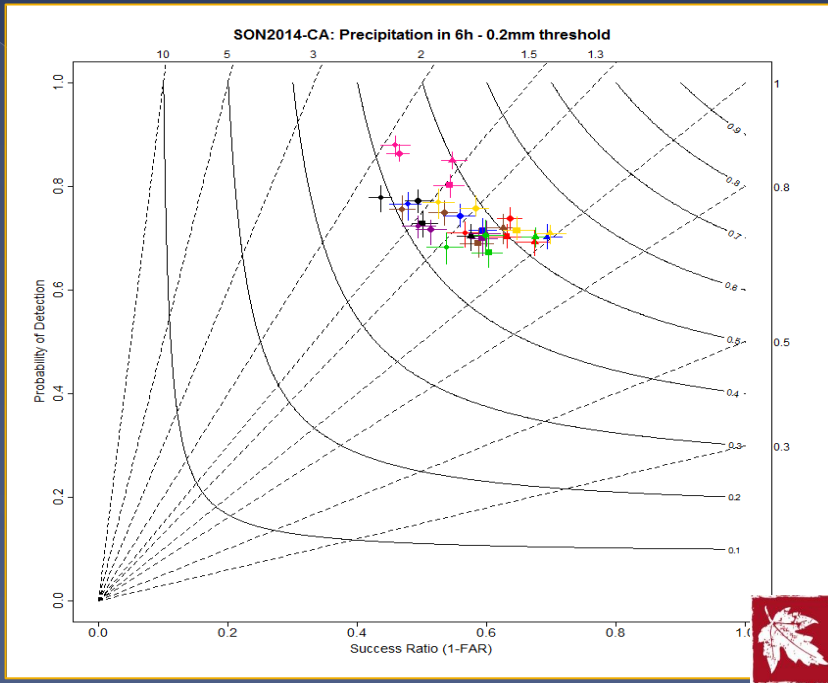
6h > 0.2mm



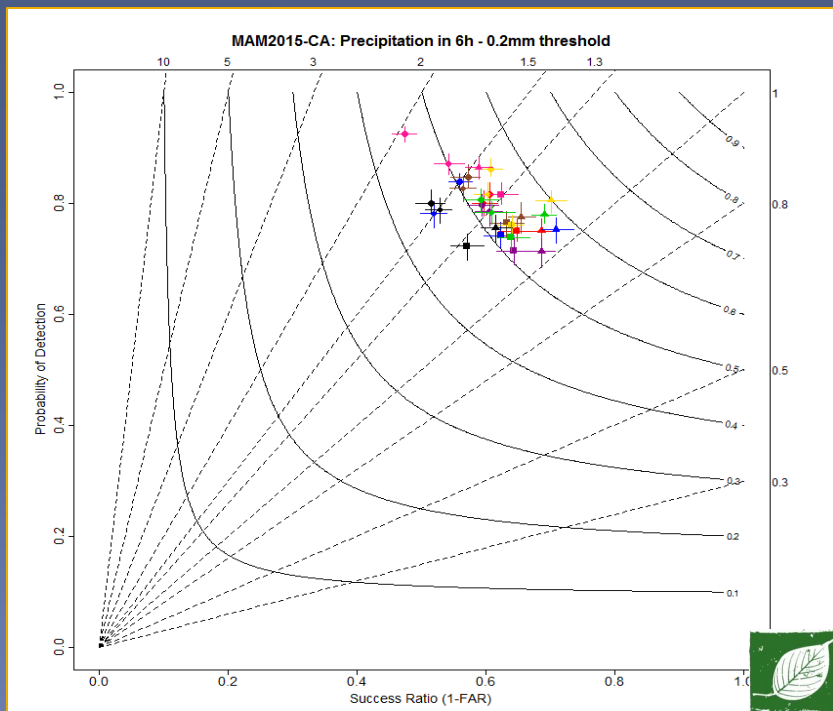
FORECAST DAY 1

- ▲ COSMO-7 + 06
- COSMO-7 + 12
- ◆ COSMO-7 + 18
- COSMO-7 + 24
- ▲ COSMO-GR + 06
- COSMO-GR + 12
- ◆ COSMO-GR + 18
- COSMO-GR + 24
- ▲ COSMO-I7 + 06
- COSMO-I7 + 12
- ◆ COSMO-I7 + 18
- COSMO-I7 + 24
- ▲ COSMO-ME + 06
- COSMO-ME + 12
- ◆ COSMO-ME + 18
- COSMO-ME + 24
- ▲ COSMO-PL + 06
- COSMO-PL + 12
- ◆ COSMO-PL + 18
- COSMO-PL + 24
- ▲ ECMWF-IFS + 06
- ECMWF-IFS + 12
- ◆ ECMWF-IFS + 18
- ECMWF-IFS + 24
- ▲ COSMO-RU + 06
- COSMO-RU + 12
- ◆ COSMO-RU + 18
- COSMO-RU + 24
- ▲ COSMO-EU + 06
- COSMO-EU + 12
- ◆ COSMO-EU + 18
- COSMO-EU + 24

SON and MAM similar with slight diurnal cycle with overestimation higher values at 18 (SON) 12 (MAM) : TS better in MAM. IFS Overestimation and higher POD.

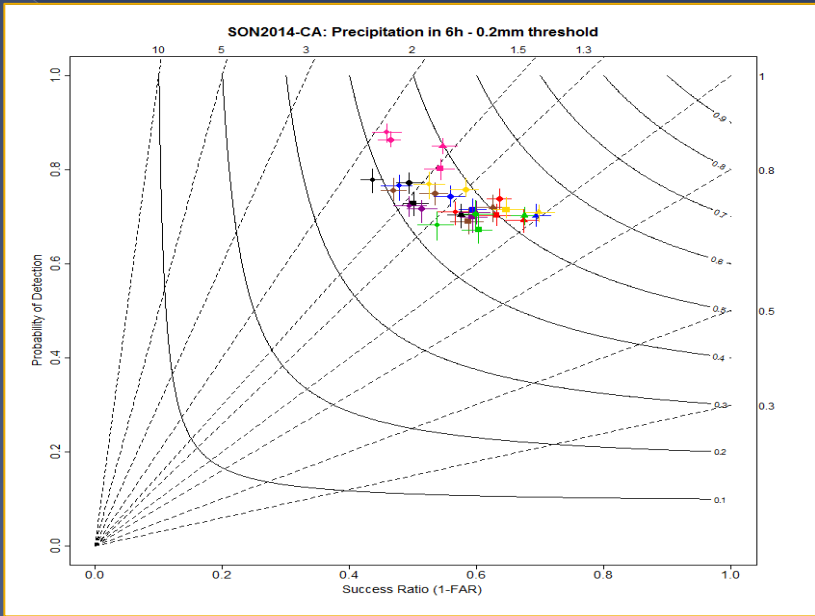


6h >0.2mm



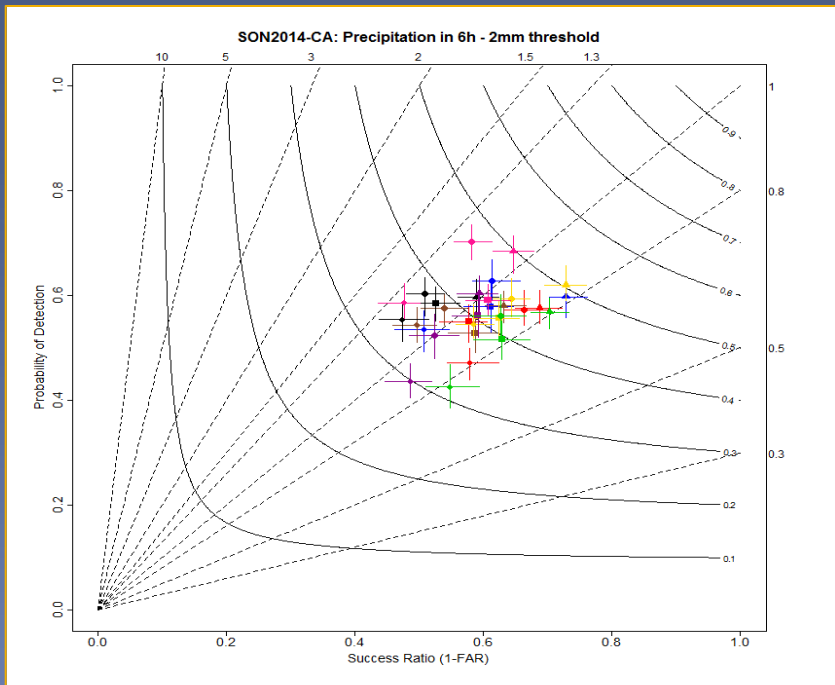
FORECAST DAY 1

- ▲ COSMO-7 + 06
- COSMO-7 + 12
- ◆ COSMO-7 + 18
- COSMO-7 + 24
- ▲ COSMO-GR + 06
- COSMO-GR + 12
- ◆ COSMO-GR + 18
- COSMO-GR + 24
- ▲ COSMO-I7 + 06
- COSMO-I7 + 12
- ◆ COSMO-I7 + 18
- COSMO-I7 + 24
- ▲ COSMO-ME + 06
- COSMO-ME + 12
- ◆ COSMO-ME + 18
- COSMO-ME + 24
- ▲ COSMO-PL + 06
- COSMO-PL + 12
- ◆ COSMO-PL + 18
- COSMO-PL + 24
- ▲ ECMWF-IFS + 06
- ECMWF-IFS + 12
- ◆ ECMWF-IFS + 18
- ECMWF-IFS + 24
- ▲ COSMO-RU + 06
- COSMO-RU + 12
- ◆ COSMO-RU + 18
- COSMO-RU + 24
- ▲ COSMO-EU + 06
- COSMO-EU + 12
- ◆ COSMO-EU + 18
- COSMO-EU + 24



With increasing Threshold, FBI decreases. TS differences among hours increase. TS lower at 18h. IFS still overestimates but difference from other models decreases with threshold

6h > 0.2mm



6h > 2mm

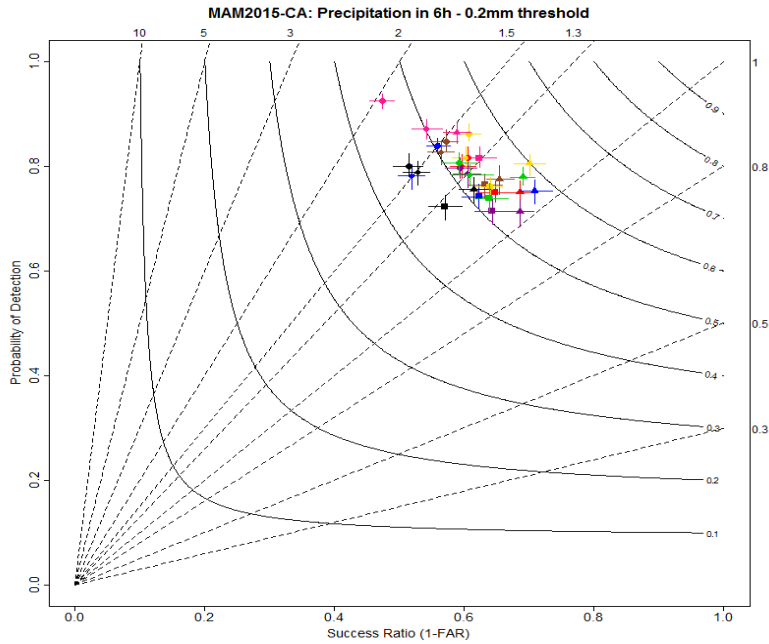
SON



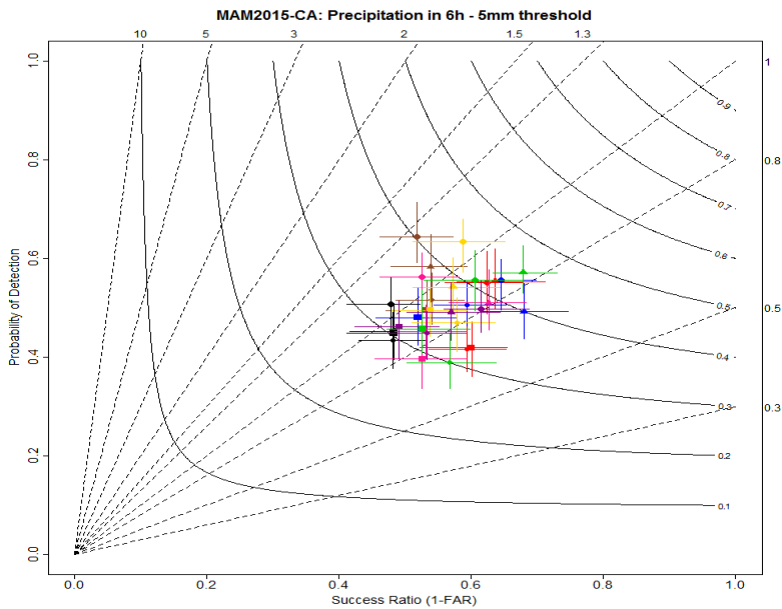
FORECAST DAY 1

- ▲ COSMO-7 + 06
- COSMO-7 + 12
- ◆ COSMO-7 + 18
- COSMO-7 + 24
- ▲ COSMO-GR + 06
- COSMO-GR + 12
- ◆ COSMO-GR + 18
- COSMO-GR + 24
- ▲ COSMO-I7 + 06
- COSMO-I7 + 12
- ◆ COSMO-I7 + 18
- COSMO-I7 + 24
- ▲ COSMO-ME + 06
- COSMO-ME + 12
- ◆ COSMO-ME + 18
- COSMO-ME + 24
- ▲ COSMO-PL + 06
- COSMO-PL + 12
- ◆ COSMO-PL + 18
- COSMO-PL + 24
- ▲ ECMWF-IFS + 06
- ECMWF-IFS + 12
- ◆ ECMWF-IFS + 18
- ECMWF-IFS + 24
- ▲ COSMO-RU + 06
- COSMO-RU + 12
- ◆ COSMO-RU + 18
- COSMO-RU + 24
- ▲ COSMO-EU + 06
- COSMO-EU + 12
- ◆ COSMO-EU + 18
- COSMO-EU + 24

Comparison of 0.2, 5mm. IFS FBI drops more than COSMO models



6h >0.2mm



6h >5mm

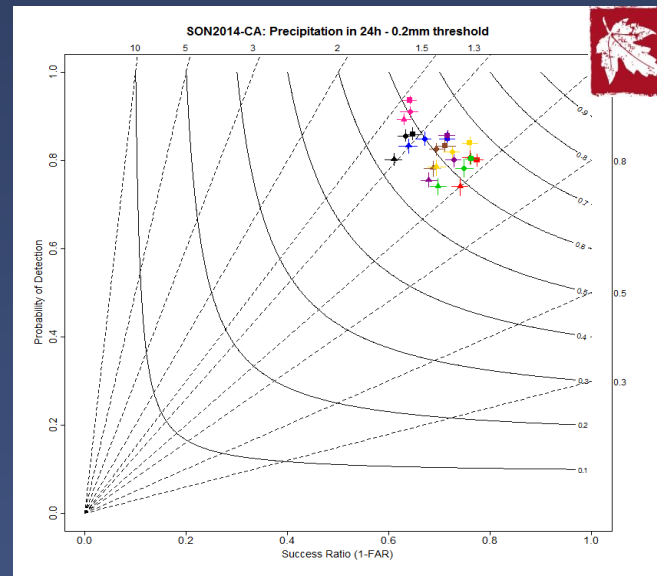
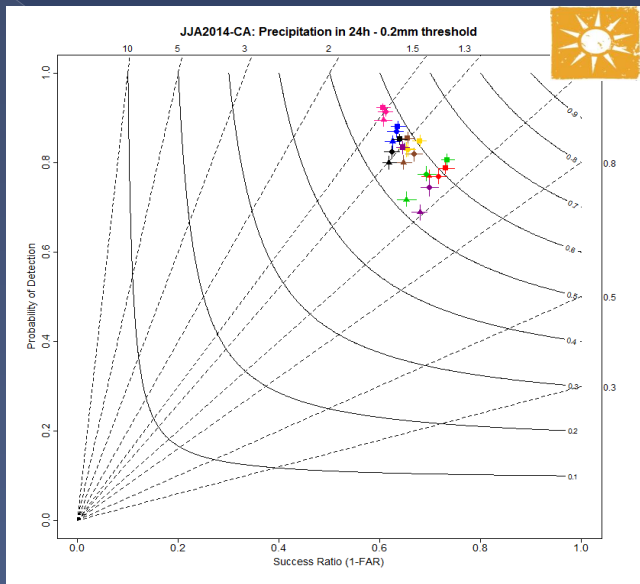
MAM



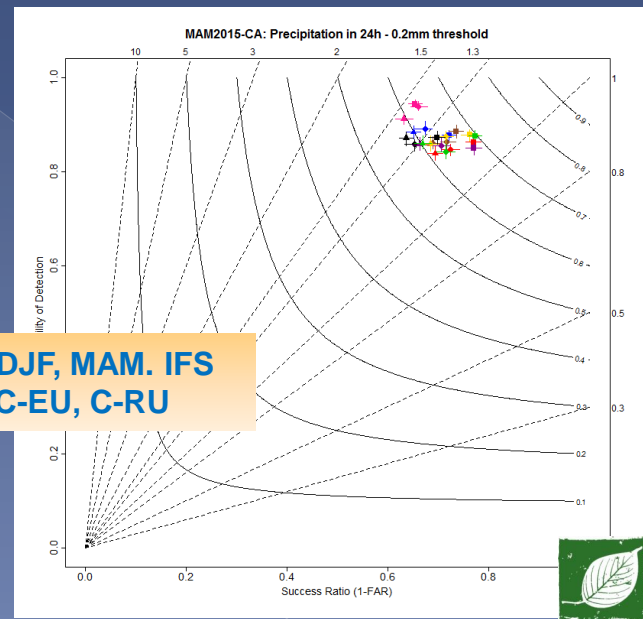
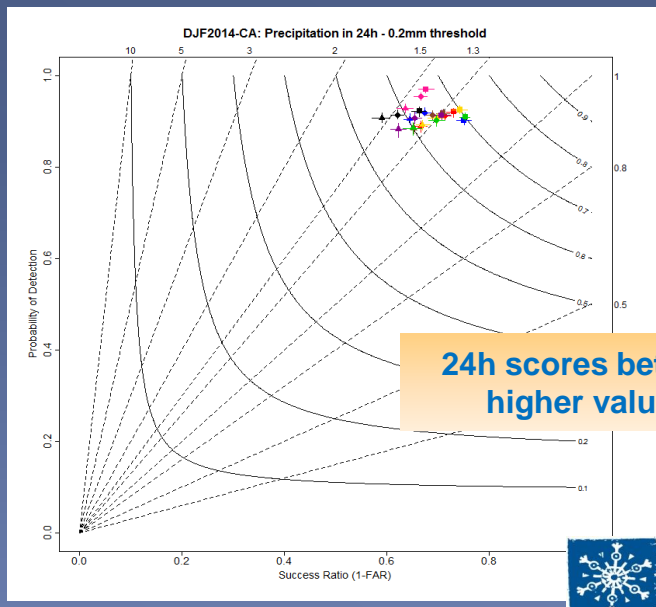
FORECAST DAY 1

- ▲ COSMO-7 + 06
- COSMO-7 + 12
- ◆ COSMO-7 + 18
- COSMO-7 + 24
- ▲ COSMO-GR + 06
- COSMO-GR + 12
- ◆ COSMO-GR + 18
- COSMO-GR + 24
- ▲ COSMO-I7 + 06
- COSMO-I7 + 12
- ◆ COSMO-I7 + 18
- COSMO-I7 + 24
- ▲ COSMO-ME + 06
- COSMO-ME + 12
- ◆ COSMO-ME + 18
- COSMO-ME + 24
- ▲ COSMO-PL + 06
- COSMO-PL + 12
- ◆ COSMO-PL + 18
- COSMO-PL + 24
- ▲ ECMWF-IFS + 06
- ECMWF-IFS + 12
- ◆ ECMWF-IFS + 18
- ECMWF-IFS + 24
- ▲ COSMO-RU + 06
- COSMO-RU + 12
- ◆ COSMO-RU + 18
- COSMO-RU + 24
- ▲ COSMO-EU + 06
- COSMO-EU + 12
- ◆ COSMO-EU + 18
- COSMO-EU + 24

Precipitation 24h 0.2mm



- 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
- ECMWF-IFS + 24
- ECMWF-IFS + 48
- ▲ ECMWF-IFS + 72
- COSMO-RU + 24
- COSMO-RU + 48
- ▲ COSMO-RU + 72
- COSMO-EU + 24
- COSMO-EU + 48
- ▲ COSMO-EU + 72



24h scores better than 6h, FBI >1 mainly DJF, MAM. IFS higher values, FBI closer to 1 for C-7, C-EU, C-RU

HIGH RESOLUTION MODELS

Only 5 models and not for all seasons

C-RU2

C-GR

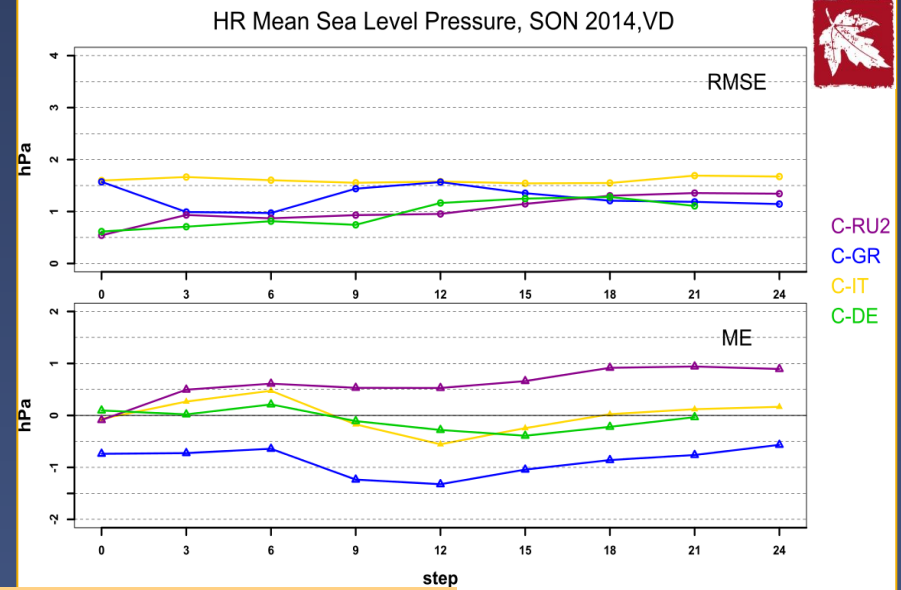
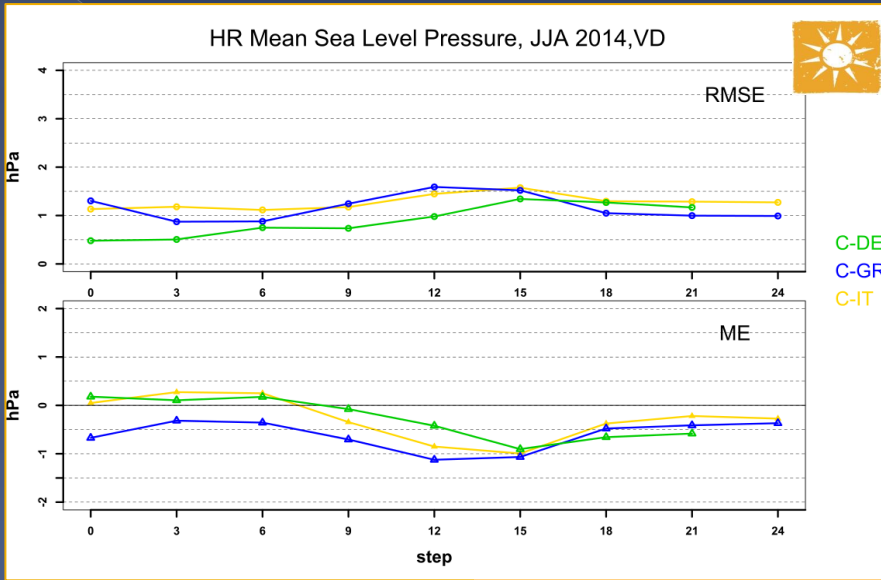
C-IT

C-I2

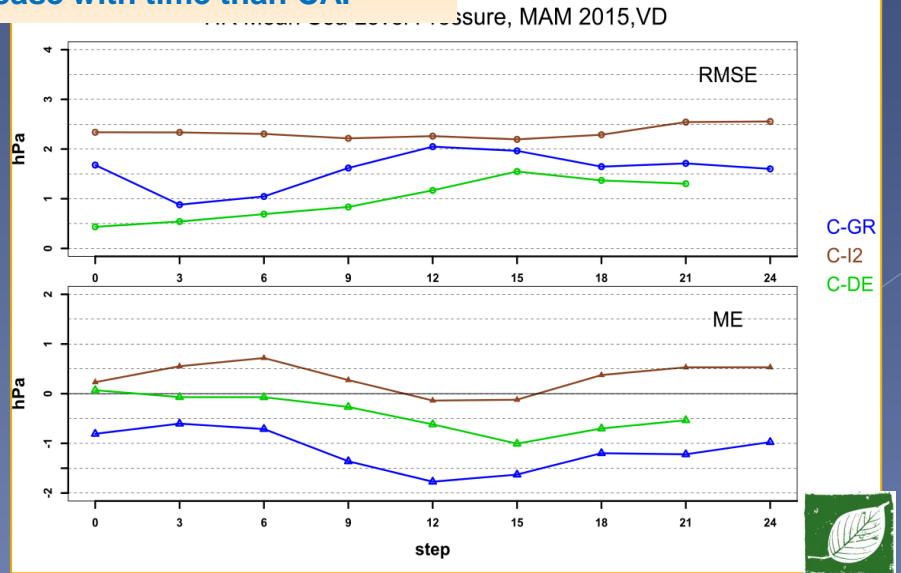
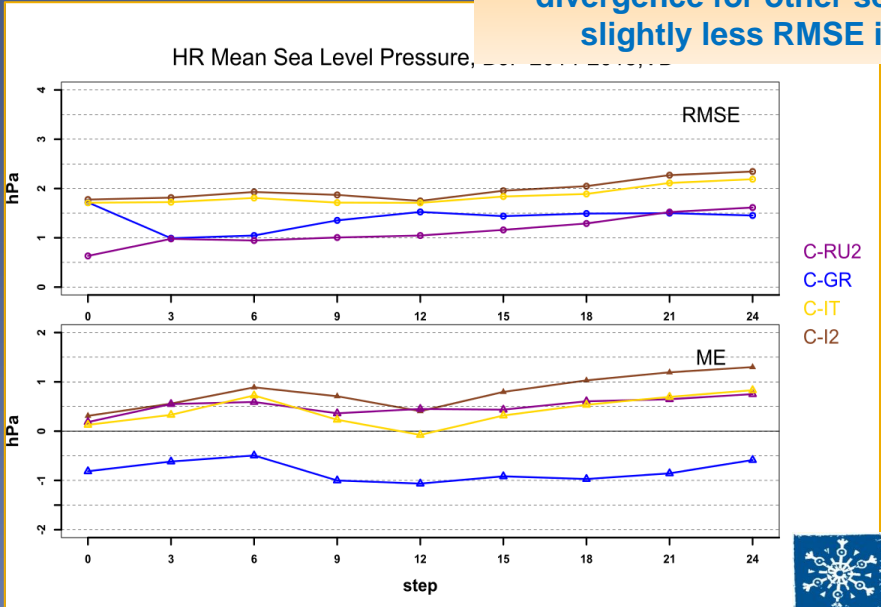
C-DE

TIME RANGE : UP TO 24 HOURS

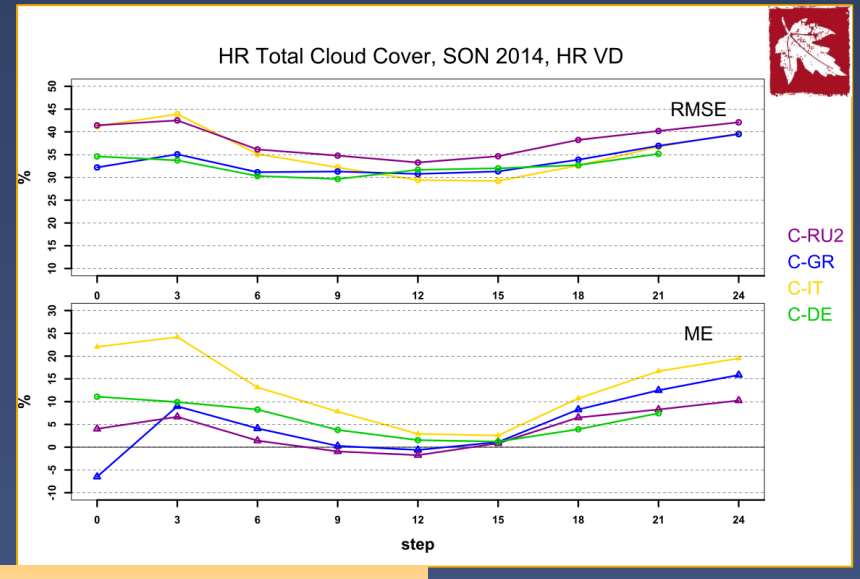
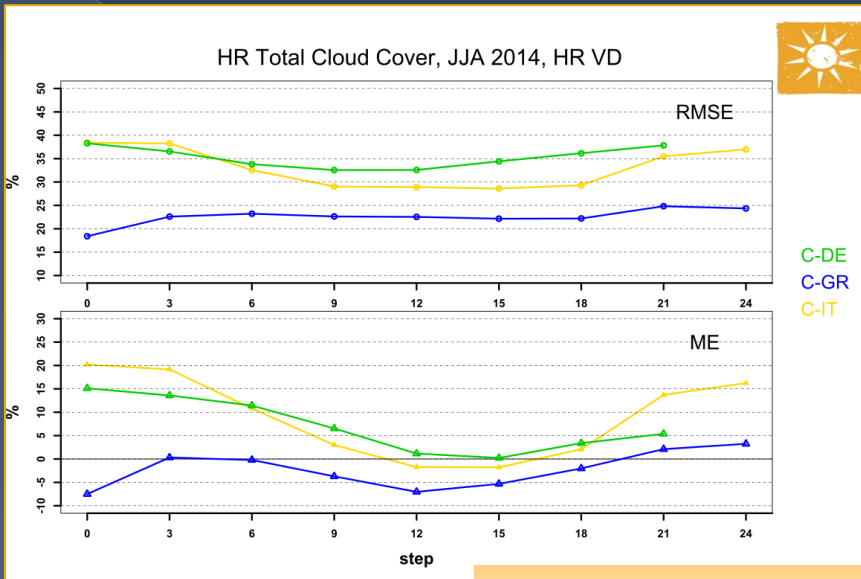
HR MSLP



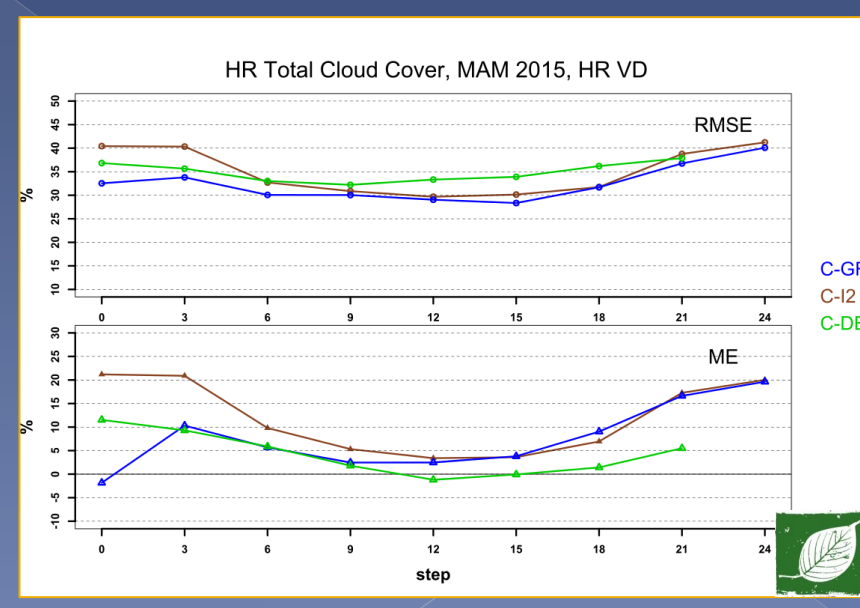
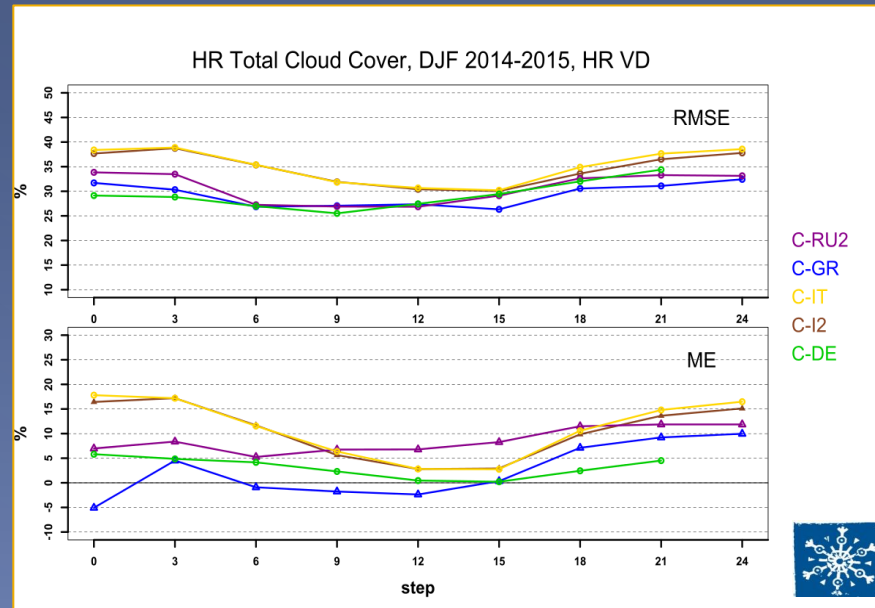
Tendency of ME < 0 and diurnal cycle for JJA and divergence for other seasons. C-GR underestimates, slightly less RMSE increase with time than CA.



TCC HR

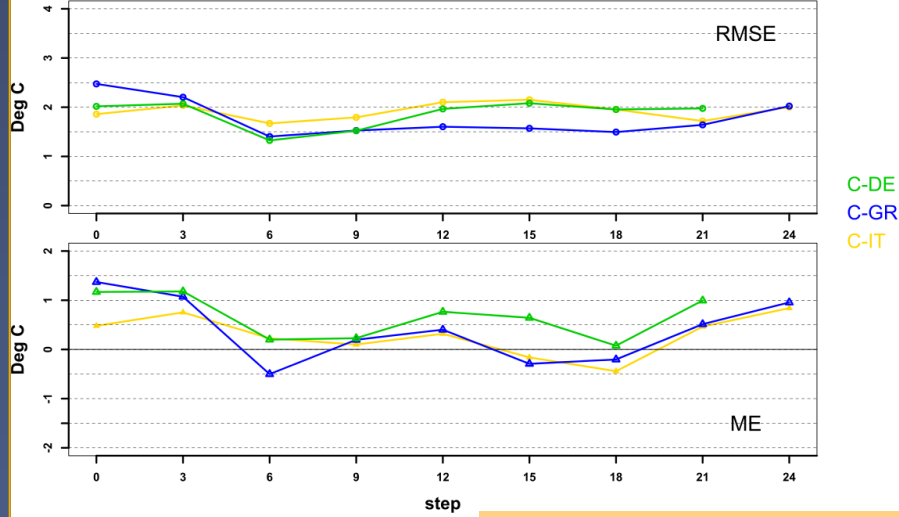


Overestimation for all models, less in the day. C-GR slightly underestimates in the day for JJA (not in CA)

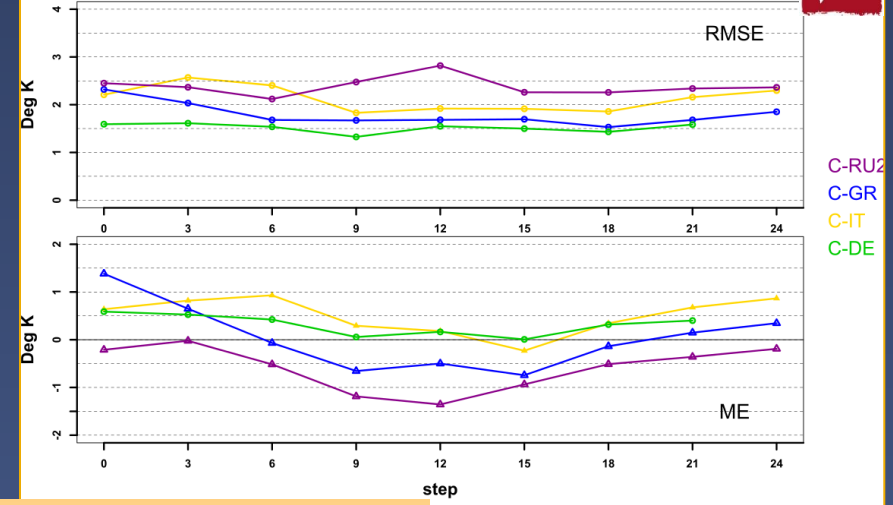


HR T2m

HR Temperature 2m, JJA 2014,VD

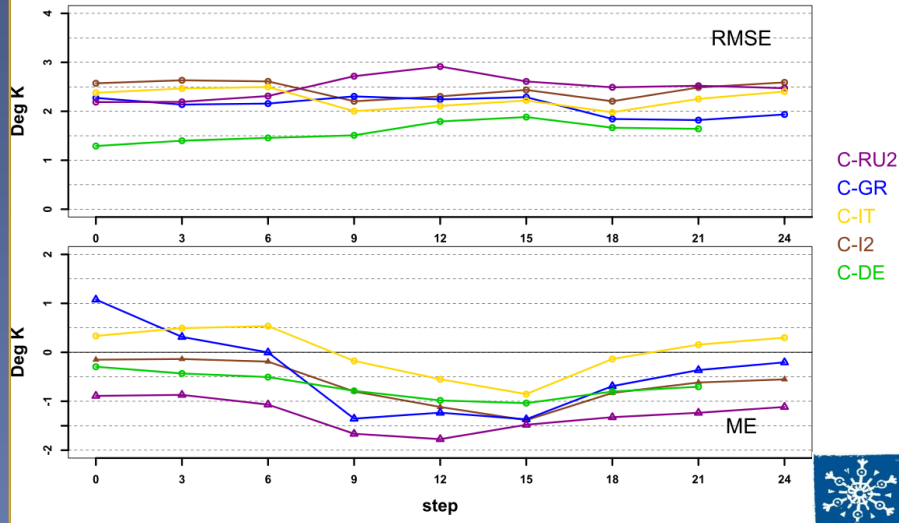


HR Temperature 2m, SON 2014,VD

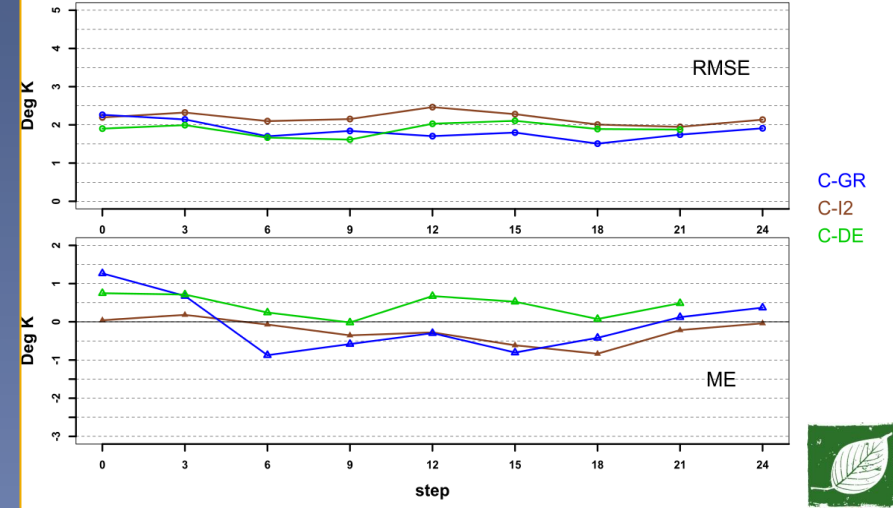


Similar behavior for all models. C-GR less errors than CA. Daytime ME > 0 for C-GR C-IT (it was < 0) in CA.

HR Temperature 2m, DJF 2014-2015,VD



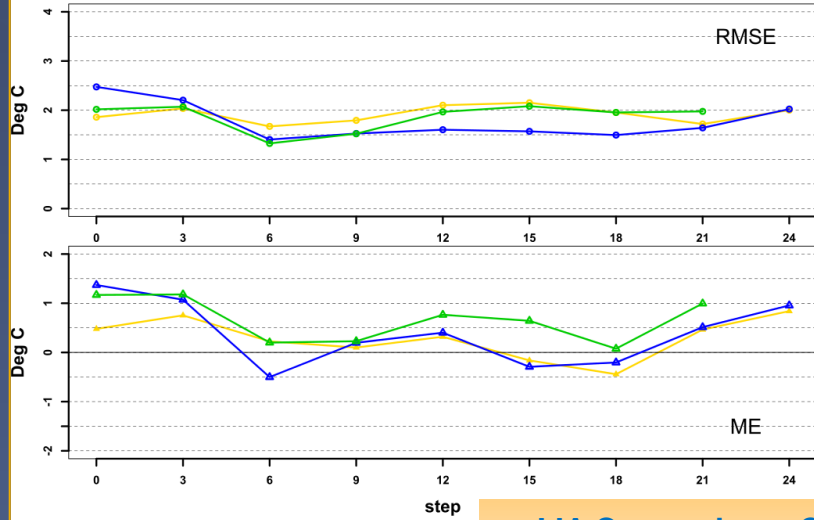
HR Temperature 2m, MAM 2015,VD



HR T2m

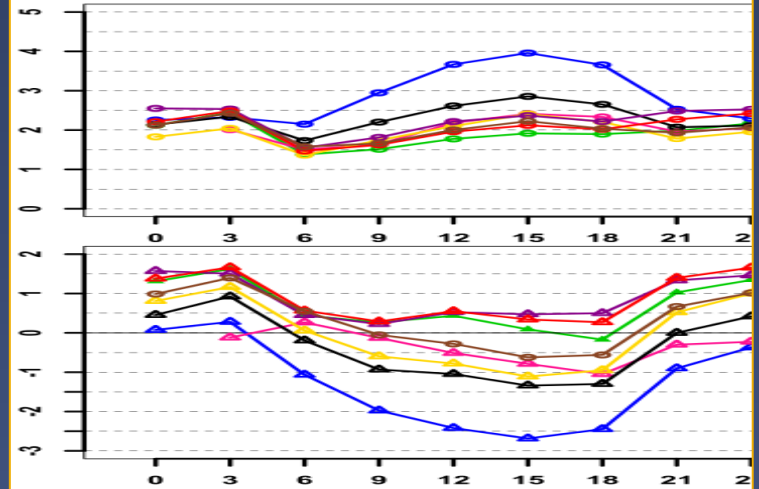


HR Temperature 2m, JJA 2014, VD



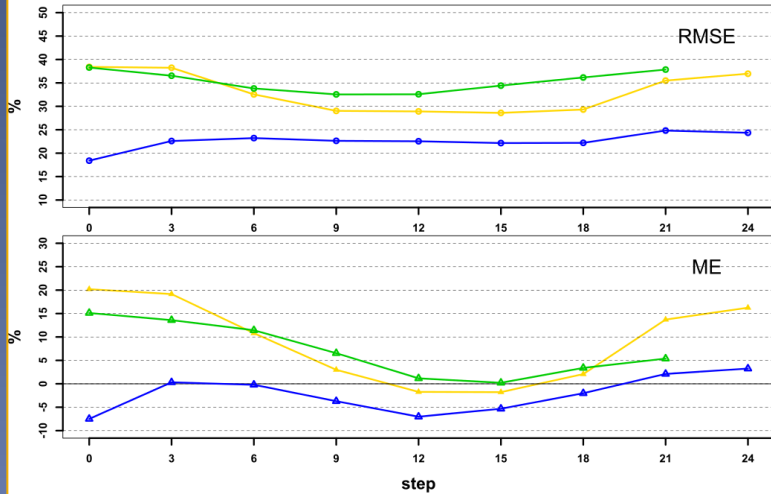
C-DE
C-GR
C-IT

Temperature 2m



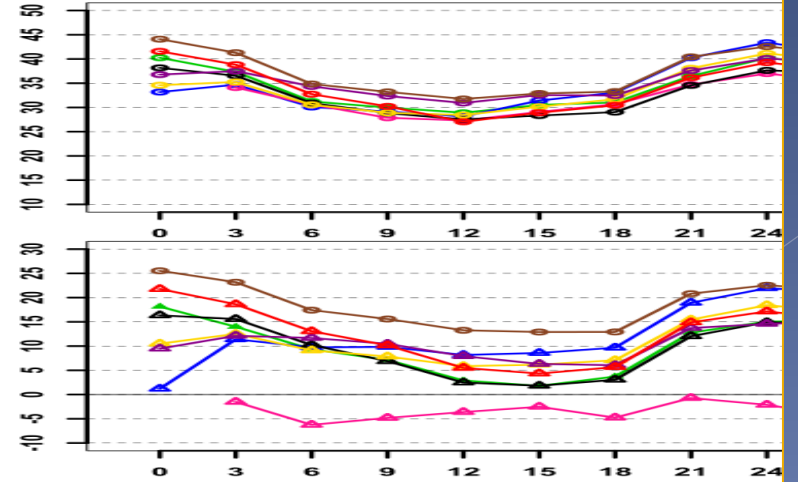
JJA Comparison C-GR different T behavior. TCC also slightly underestimates in VD. Different weather and cloud types from others ?

HR Total Cloud Cover, JJA 2014, HR VD



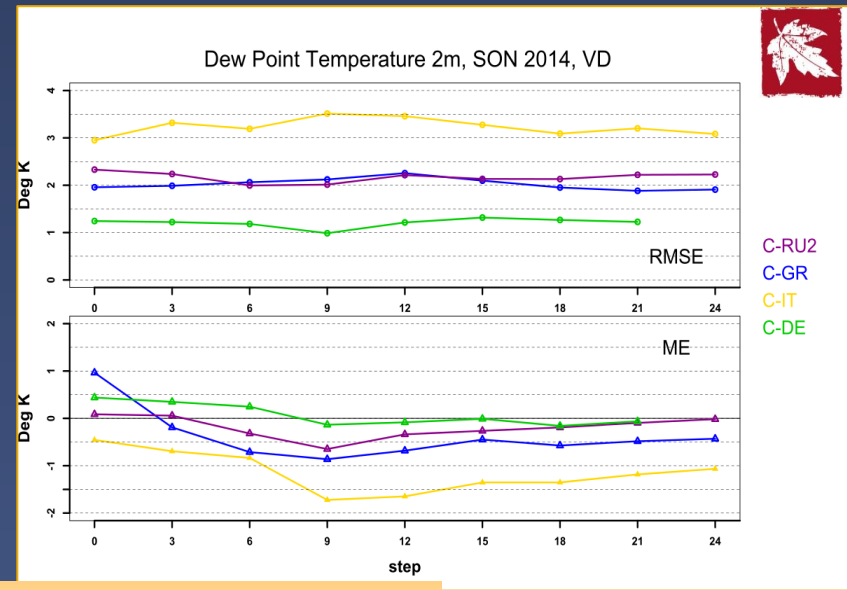
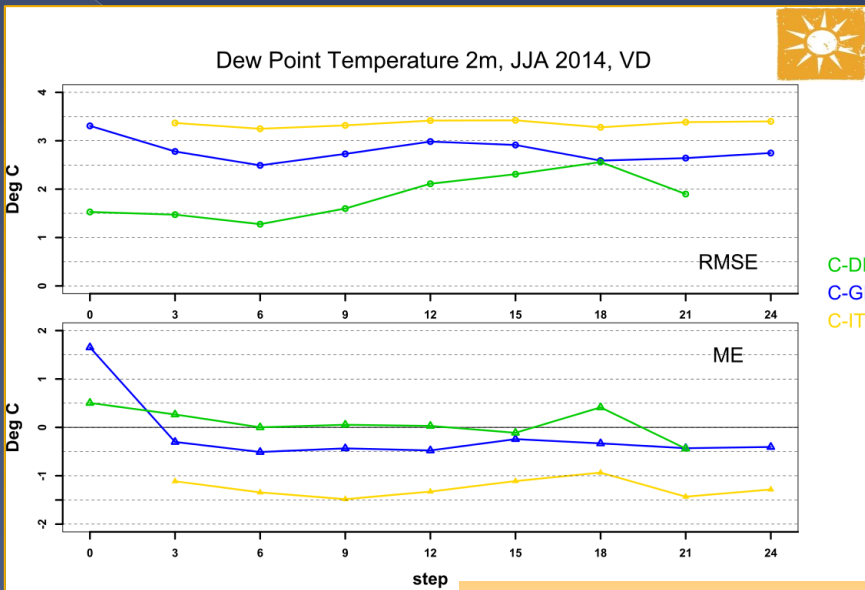
C-DE
C-GR
C-IT

Total Cloud Cover

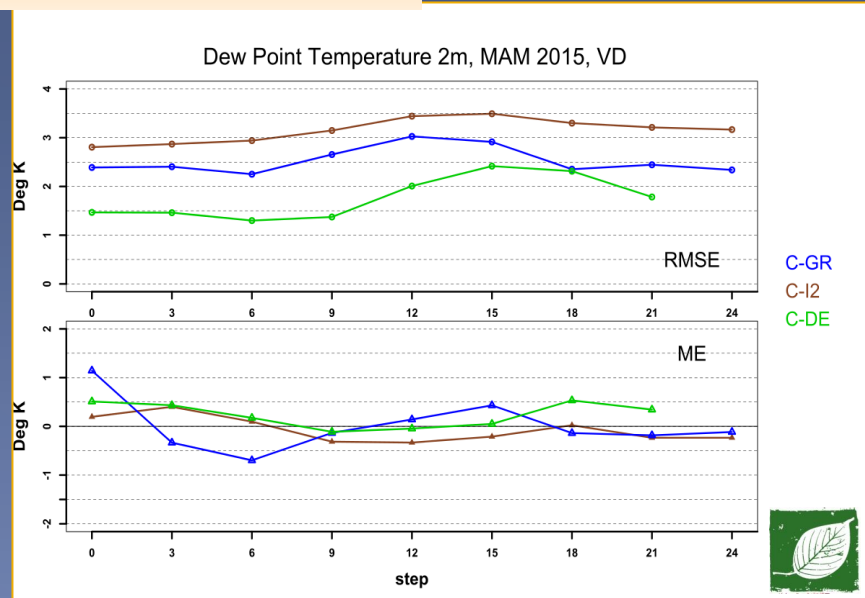
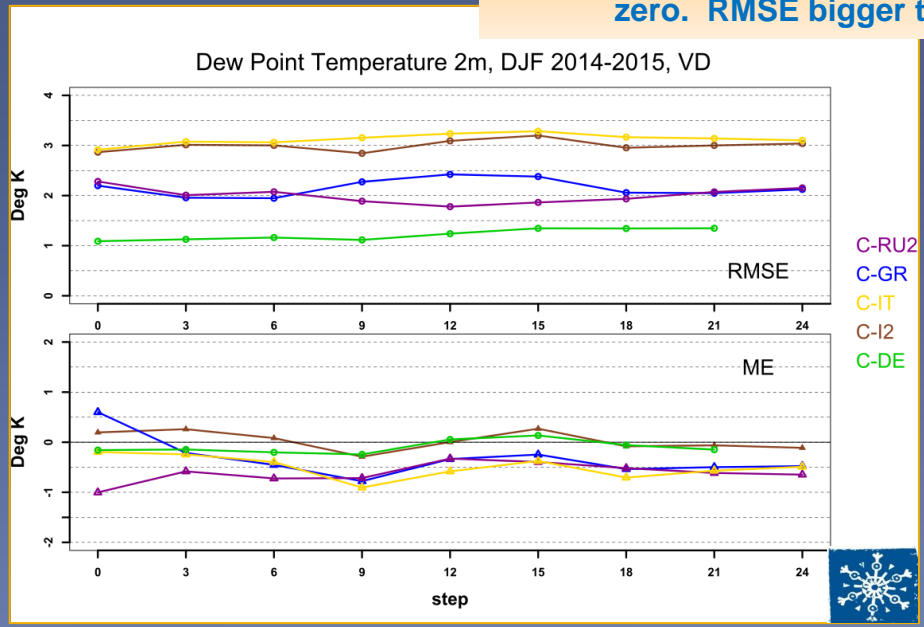


TCC

TDew HR

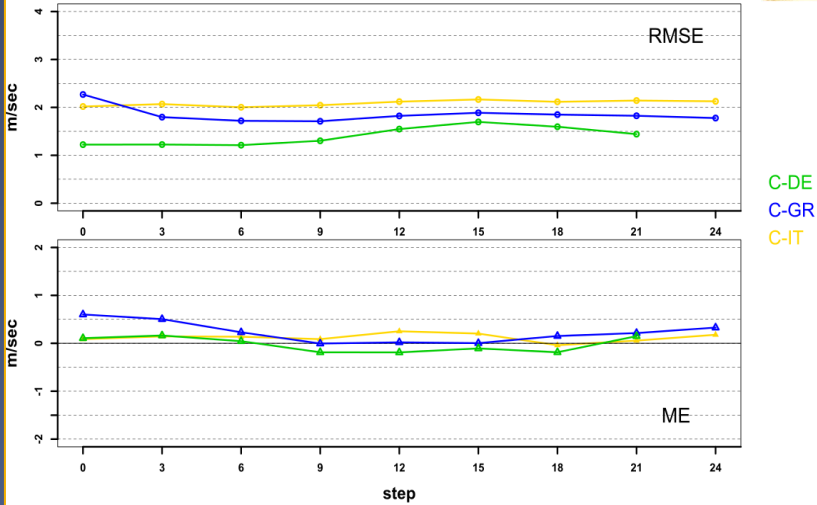


Not clear diurnal cycle for JJA as in CA. C-DE close to zero. RMSE bigger than CA for C-ME, C-I2

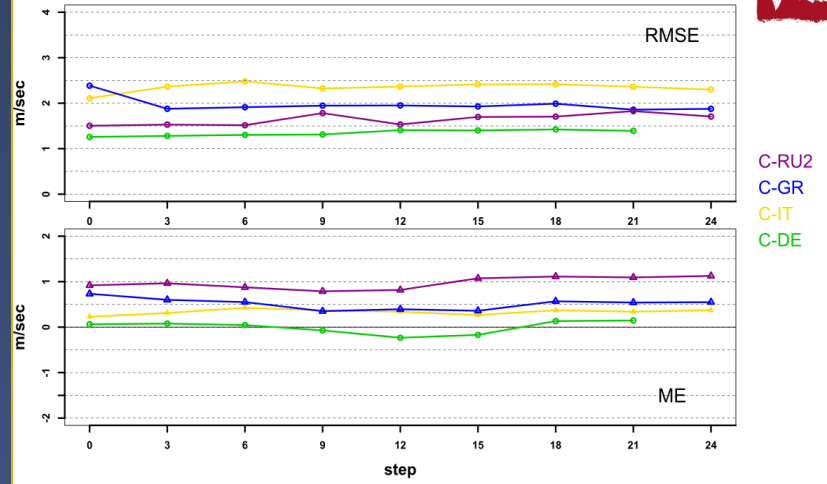


Wind Speed HR

HR Wind Speed 10m, JJA 2014, VD



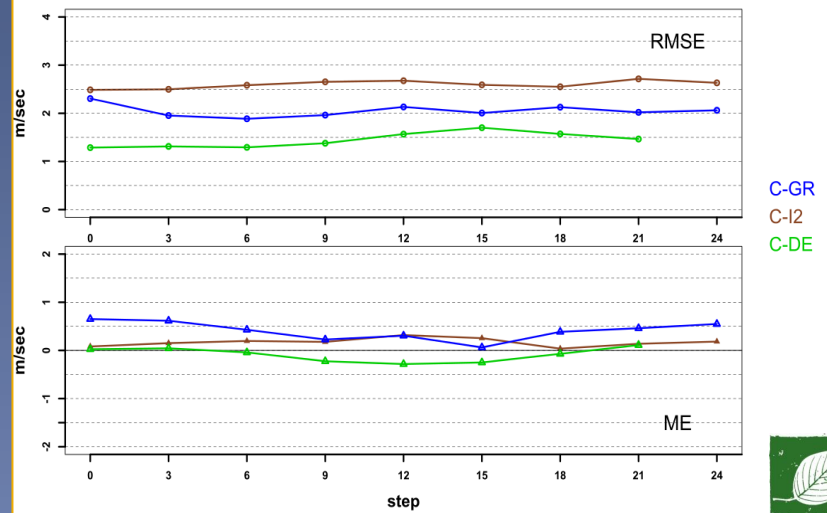
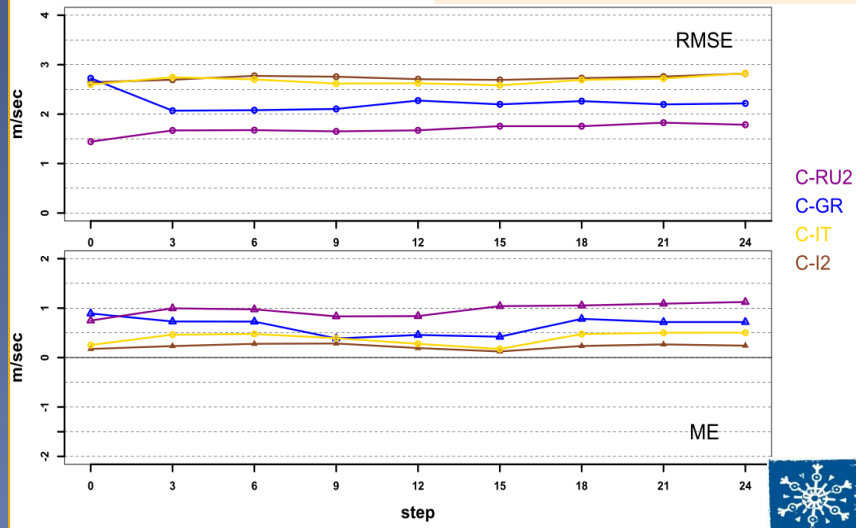
HR Wind Speed 10m, SON 2014, VD



Similar behavior for all models especially JJA with ME > 0
C-DE slightly negative. No diurnal cycle as in CA. RMSE
bigger for C-ME, C-I7

HR Wind Speed 10m,

, MAM 2015, VD

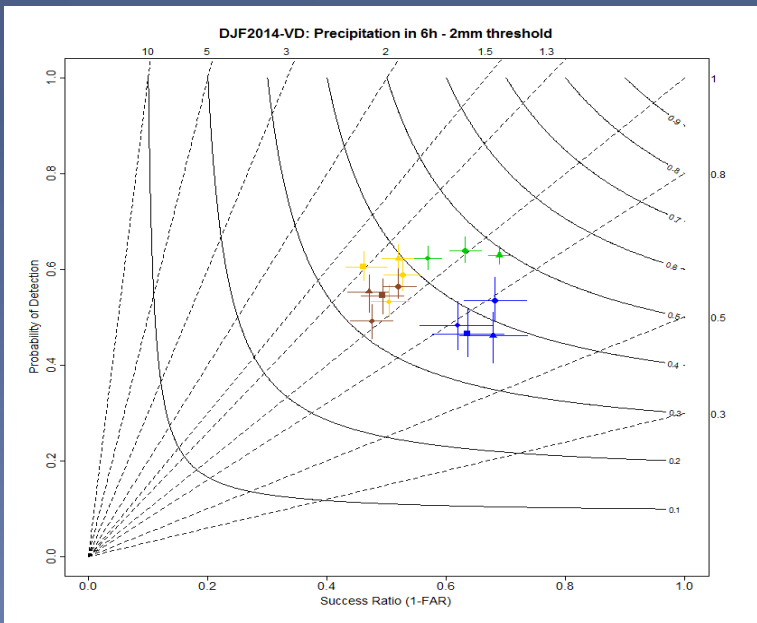
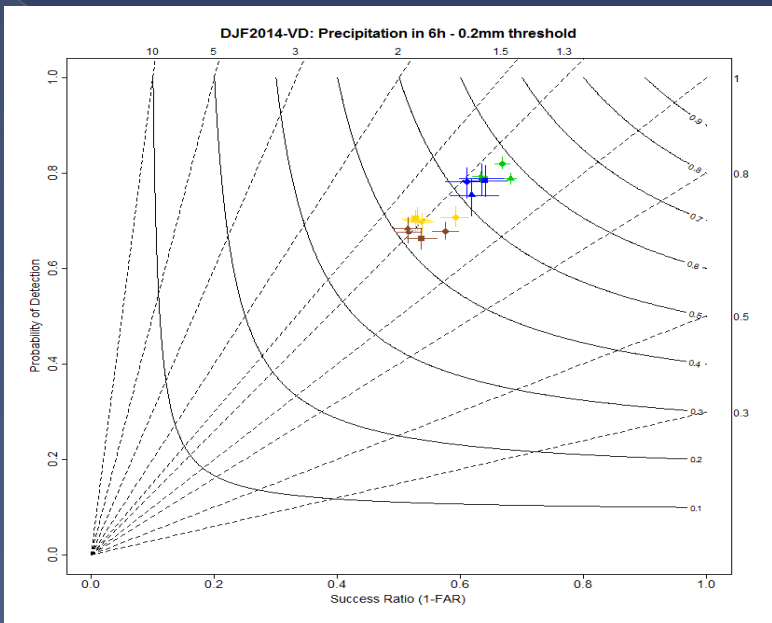


HR Precipitation 6h

FBI > 0, Better TS C-DE, FBI decreases more for C-GR for 2mm

6h > 0.2mm

6h > 2mm



- FORECAST DAY 1
- ▲ COSMO-IT + 06
 - COSMO-IT + 12
 - ◆ COSMO-IT + 18
 - COSMO-IT + 24
 - ▲ COSMO-GR + 06
 - COSMO-GR + 12
 - ◆ COSMO-GR + 18
 - COSMO-GR + 24
 - ▲ COSMO-I2 + 06
 - COSMO-I2 + 12
 - ◆ COSMO-I2 + 18
 - COSMO-I2 + 24
 - ▲ COSMO-DE + 06
 - COSMO-DE + 12
 - ◆ COSMO-DE + 18

Conclusions-ideas

1. We investigated the errors of COSMO models over a common dataset from JJA 2014 to MAM 2015.
2. The results showed that winds and cloud cover behaviour is more consistent among models for all seasons.
3. Precipitation cycles differ among seasons due to convective precipitation.
4. Differences between CA and VD HR results may depend on the weather regimes, resolution, land use and terrain.
5. More collaboration is needed for next year, with all members commenting on the plots, reports should be finalized at the end of the COSMO year, in order to have a yearly image of the results. More plots may be necessary in order to have a better concept of the errors (one plot with all seasons for each country).

WCG5

Thank you for your attention !
Ideas? Questions ?