



# Greek domain verification 2023-2024

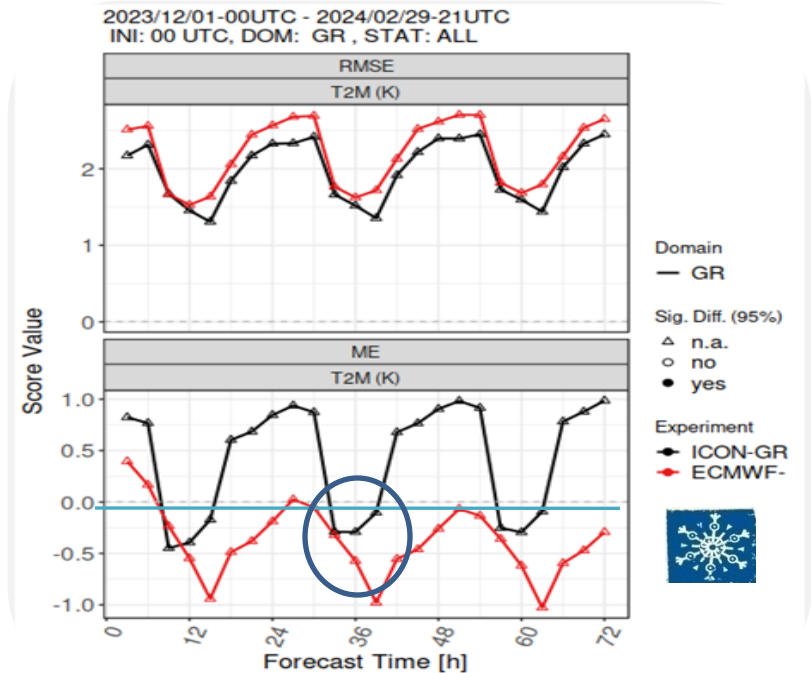
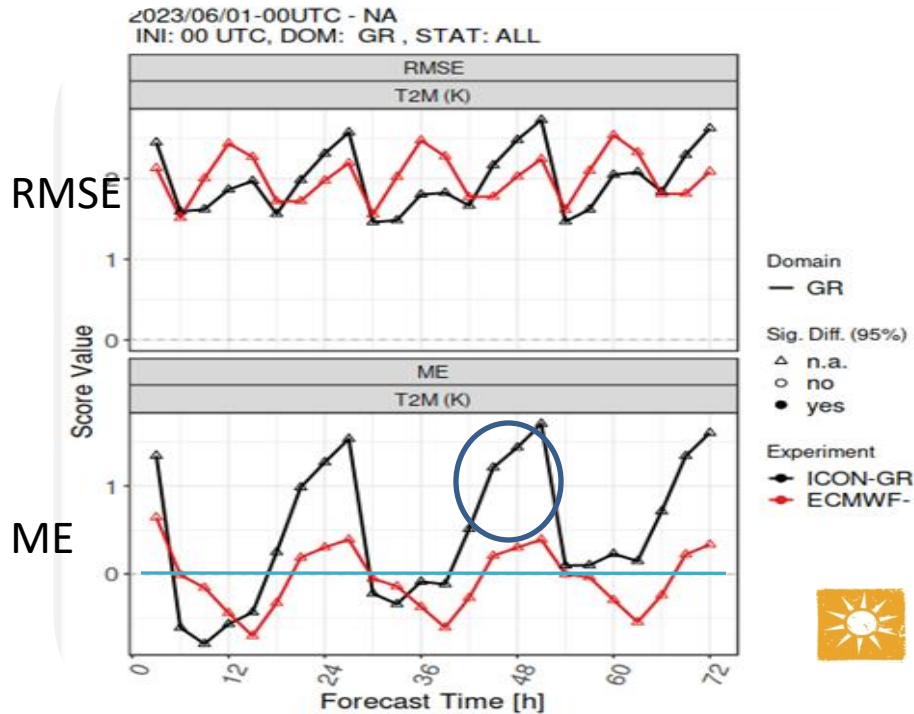
**ICON-GR2.5**

**IFS-ECMWF**

Dimitra Boucouvala

## 2m TEMPERATURE

- ICON-GR2.5
- IFS-ECMWF



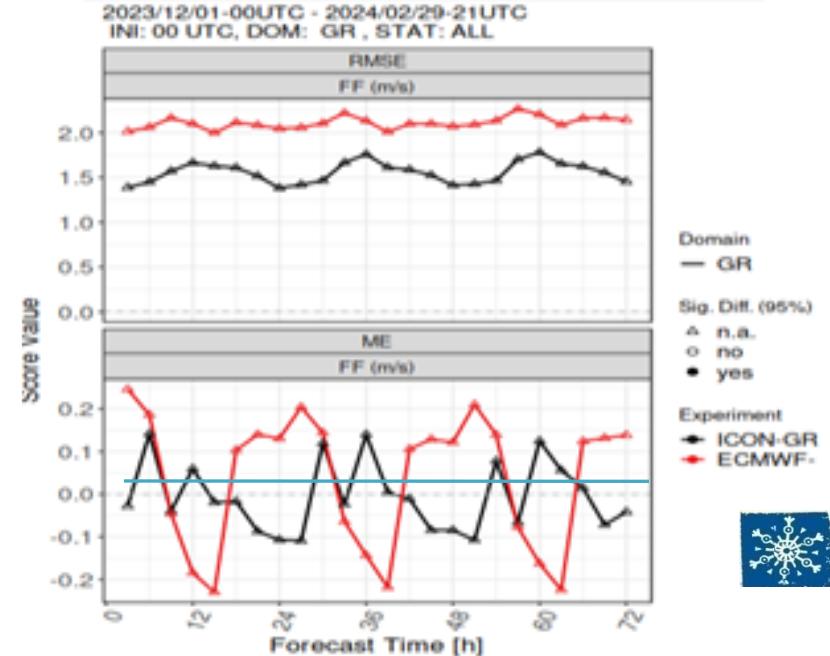
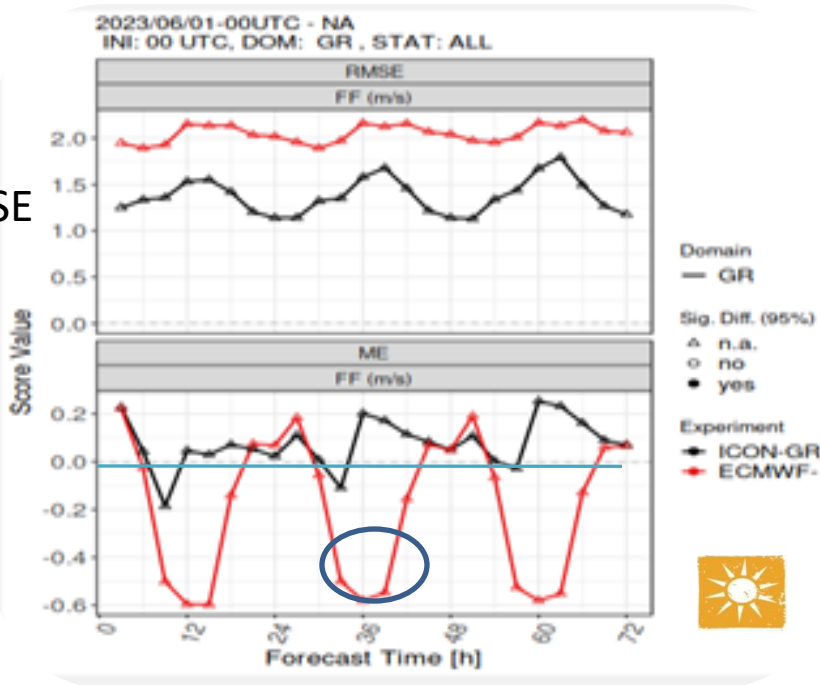
ICON-GR **overestimates** 2mT for all seasons during late afternoon hours and night .  
Both models slightly **underestimate** around noon, ICON-GR less.  
RMSE similar for both models- higher at night- slightly better is for ICON-GR.

- ICON-GR2.5
- IFS-ECMWF

## 10m WIND SPEED

RMSE

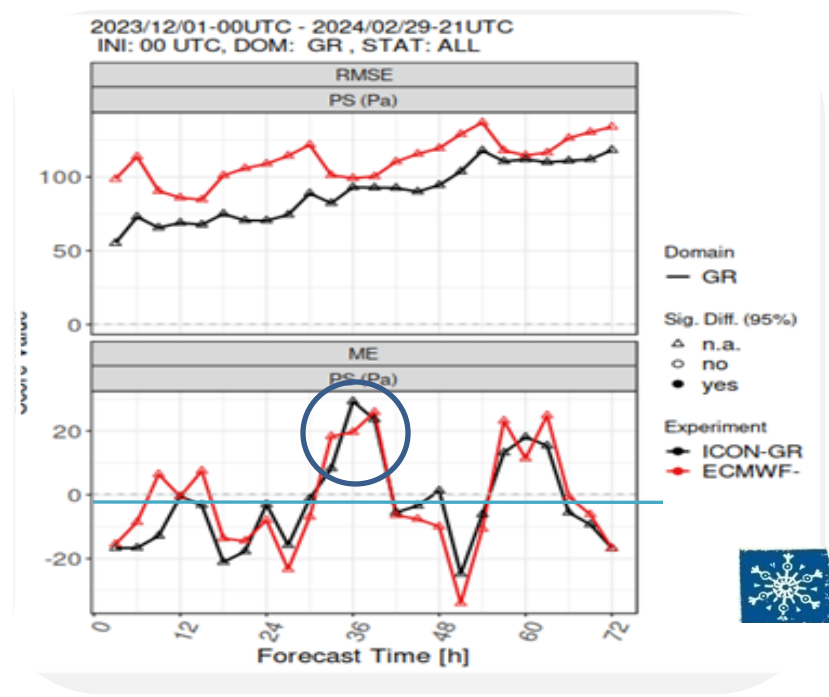
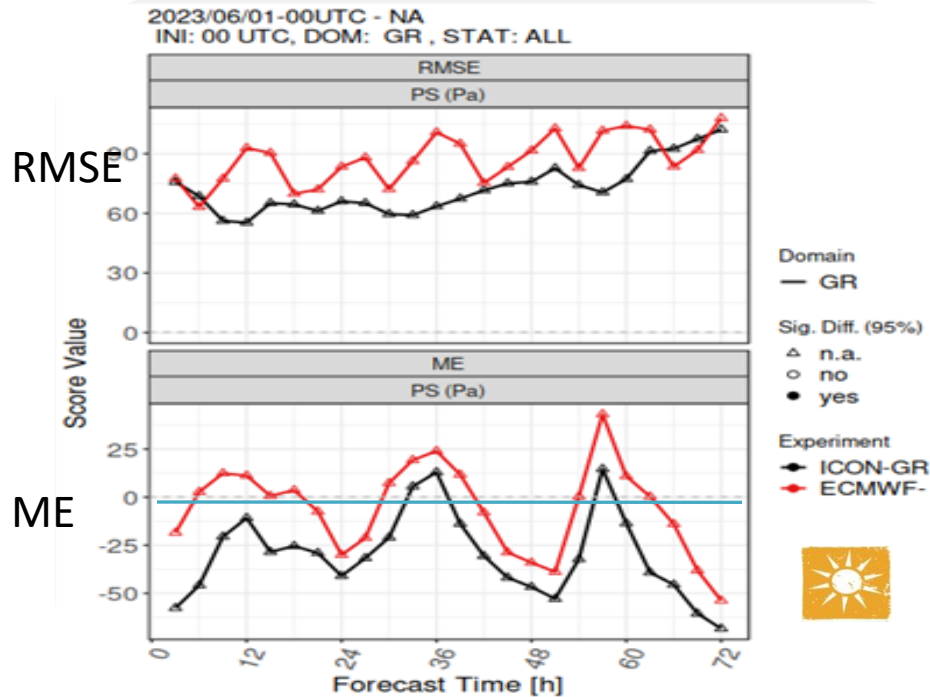
ME



RMSE better for ICON-GR in all seasons. Bias variability differs and is weaker for ICON-GR. IFS underestimates in warm hours, when a slight overestimation is shown for ICON-GR.

## SURFACE PRESSURE

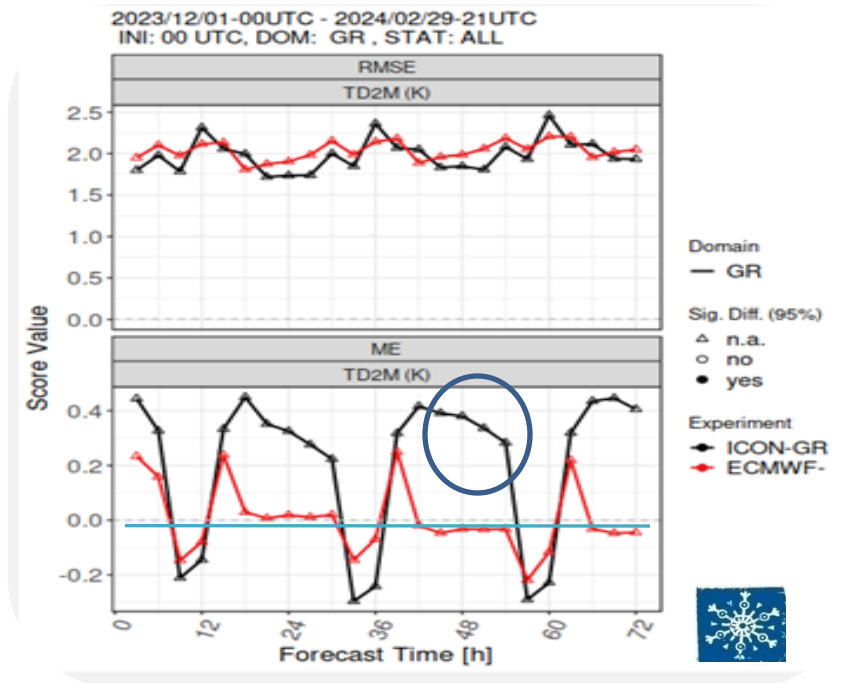
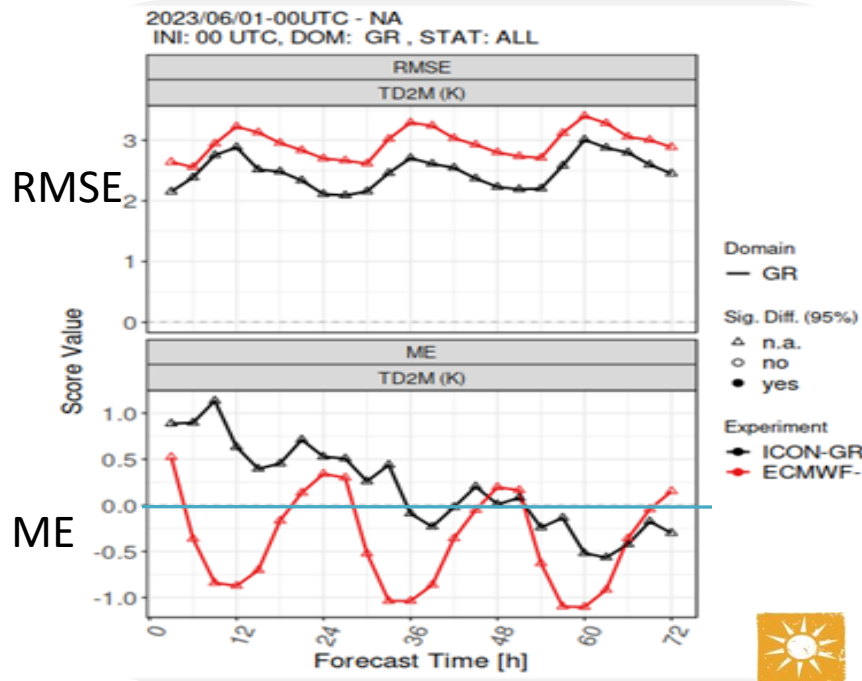
- ICON-GR2.5
- IFS-ECMWF



RMSE lower for ICON-GR in all seasons. Similar bias variability for both models with pressure **overestimation in warm hours**  
Both scores increasing with lead time especially RMSE.

## 2m DEW POINT TEMPERATURE

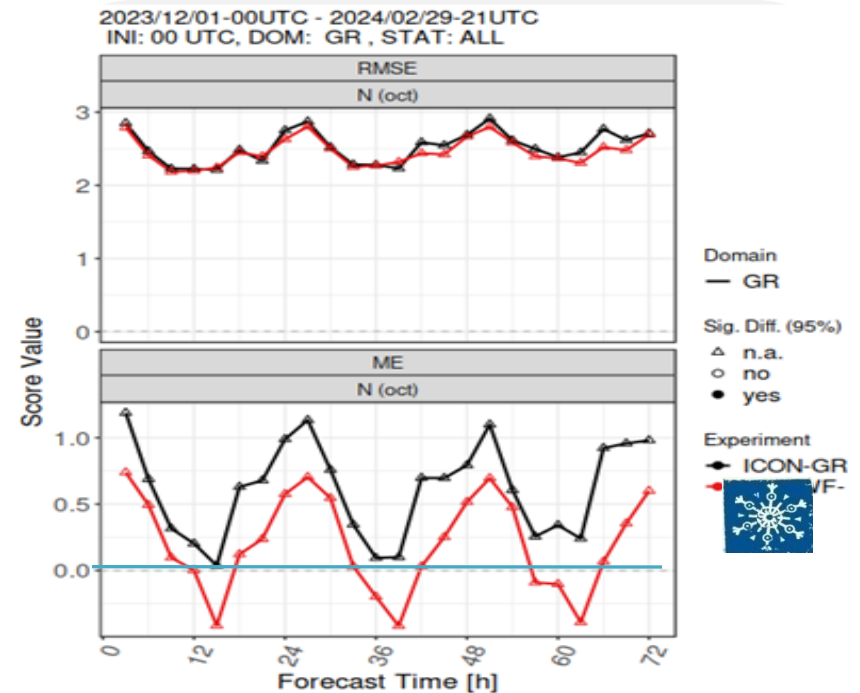
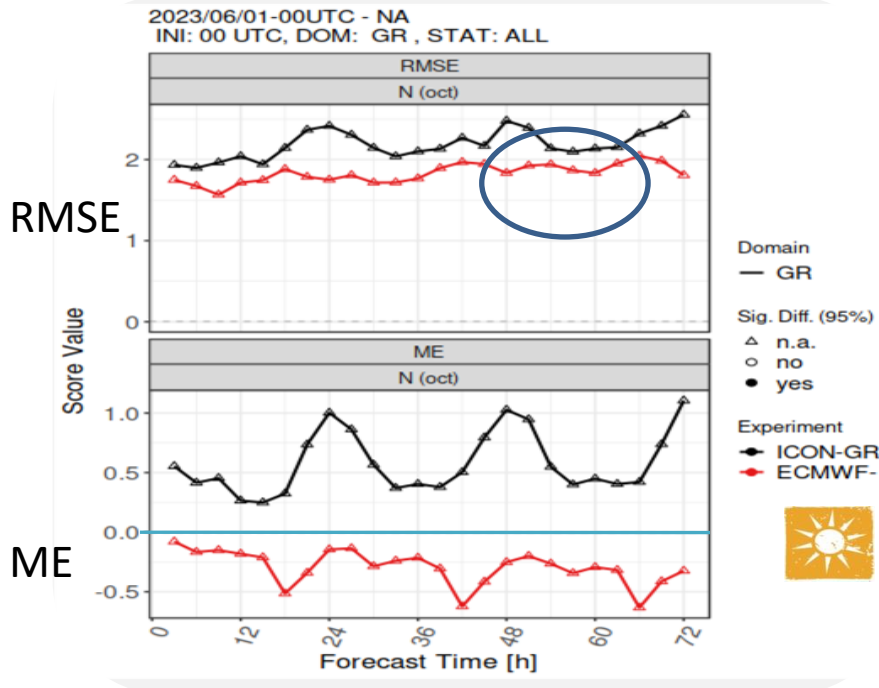
- ICON-GR2.5
- IFS-ECMWF



ICON-GR **overestimates Td2m** in late afternoon and night- less bias variability in JJA .  
RMSE almost similar for both models - ICON-GR slightly lower.

- ICON-GR2.5
- IFS-ECMWF

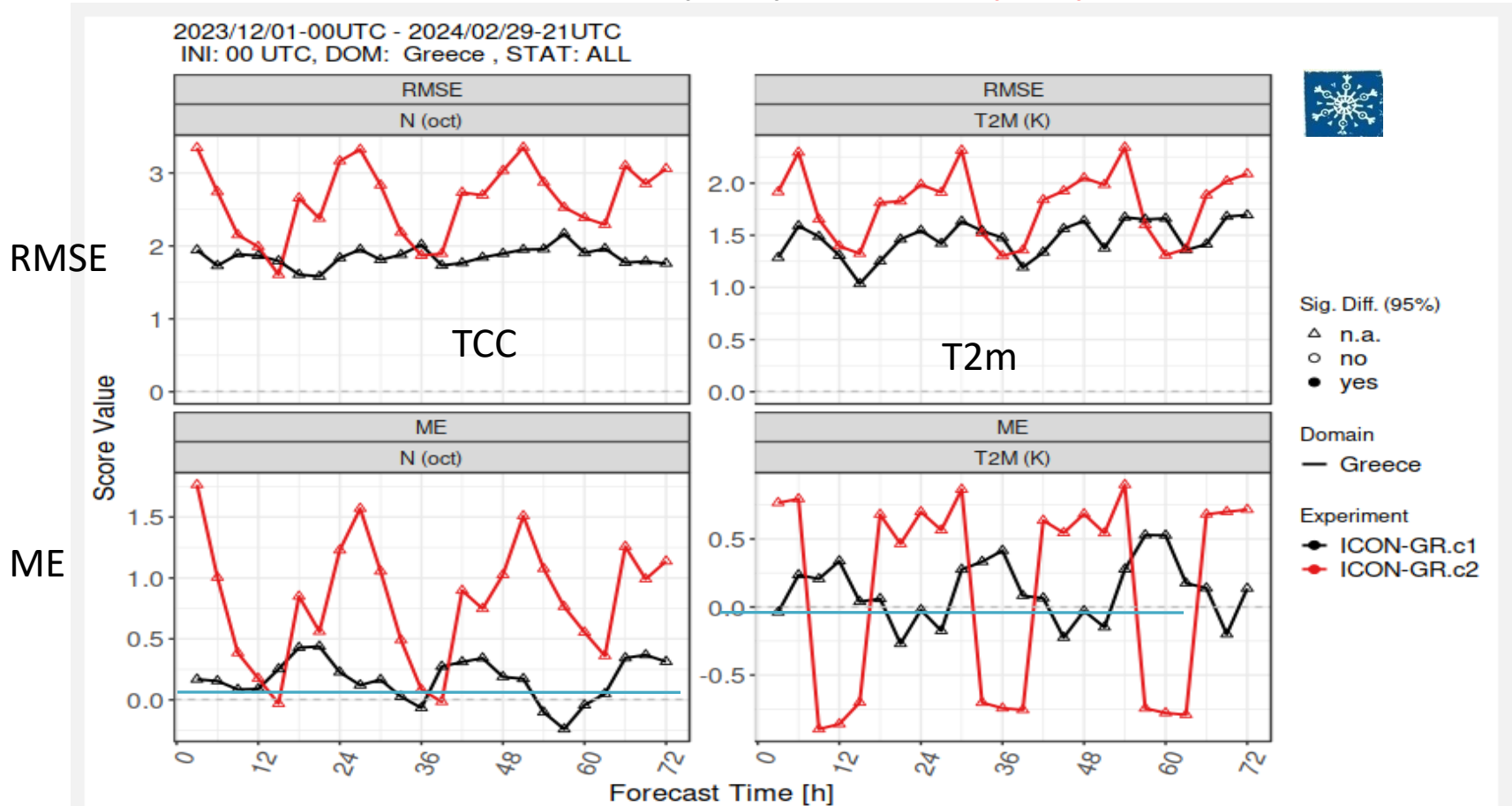
## TOTAL CLOUD COVER



**ICON-GR overestimates** TCC for all seasons mainly at night . **IFS** has tendency of **underestimation** especially in warm seasons. RMSE similar for both models but ICON-GR slightly worse in summer.

# ICON-GR CONDITIONAL VERIFICATION BASED ON TCC COVERAGE

C1 obs  $\geq 6$  (HIGH) , C2 obs  $< 2$  (LOW)



Errors are higher for the condition **C2-LOW** coverage for both T2m and TCC.  
2mT bias variability is opposite for the two conditions with the **C2-LOW** overestimating at night and underestimating at noon.

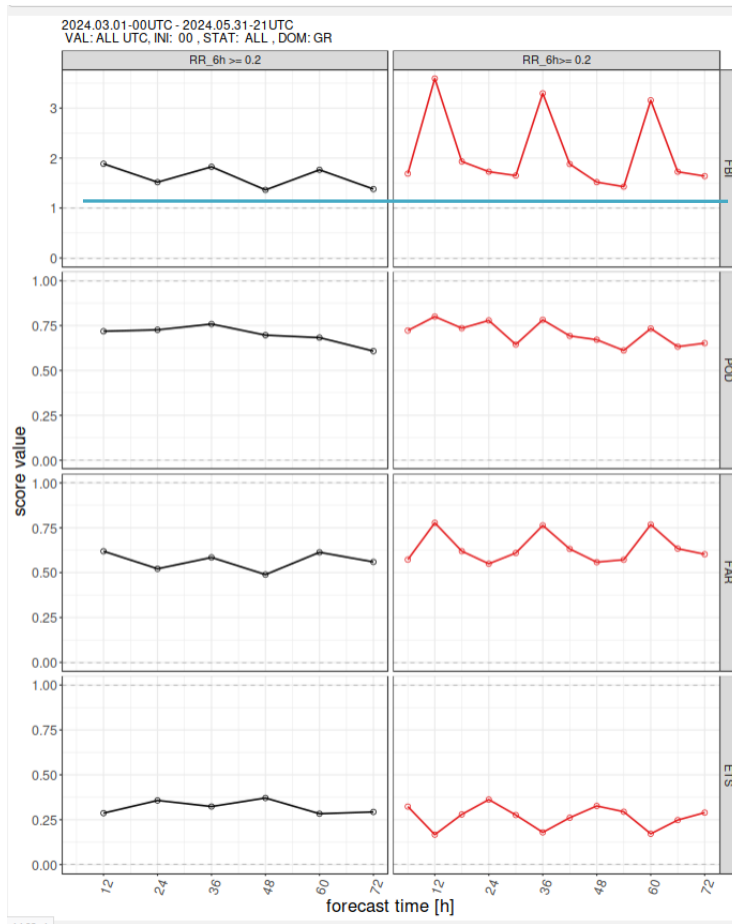
## 6H PRECIPITATION

0.2 mm



• ICON-GR2.5

10 mm • IFS-ECMWF

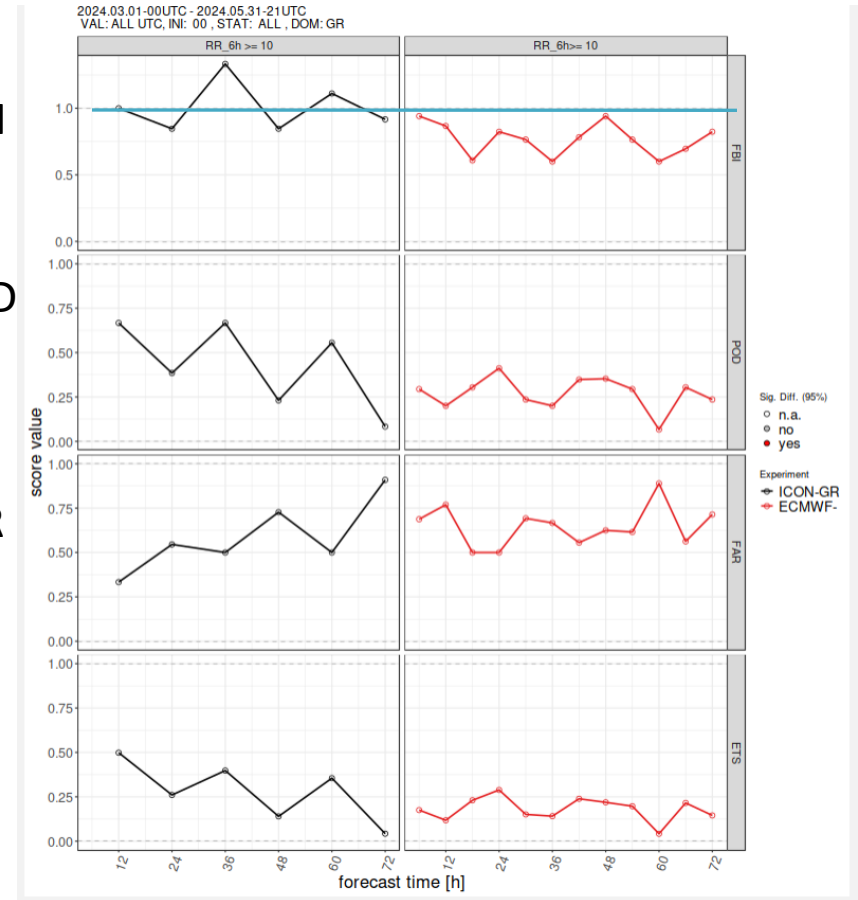


FBI

POD

FAR

ETS



MAM: Overestimation of **low** threshold events especially for IFS in daytime . Events for high thresholds are underestimated with IFS. POD and FAR are slightly higher for IFS for **low** threshold and ETS better for ICON-GR. And scores for high thresholds drop with lead time.



# CONCLUSIONS

## RMSE:

ICON-GR is mainly lower or similar for all parameters. Only for TCC and JJA season IFS score is better. There is an increase of RMSE for MSLP with lead time for both models.

## BIAS:

**2mT** : ICON-GR bias is positive and higher than IFS during late afternoon hours and night. Slightly negative and better than IFS for noon.

**Wind Speed** : ICON-GR weaker bias variability than IFS with slight overestimation in warm hours.

**MSLP** : bias variability is similar for both models with overestimation in warm hours.

**Td2m**: ICON-GR overestimates especially during fall and winter in afternoon hours.

**TCC**: ICON-GR overestimates mainly at night, while IFS shows tendency of underestimation especially in warm seasons.

**BOTH SCORES** are worse for TCC and T2m when the condition of LOW CLOUD cover is applied.

**PRECIPITATION SCORES** : Low precipitation events are overestimated especially for IFS and daytime. For higher thresholds results tendency of IFS underestimation for warmer seasons- ICON-GR POD/FAR scores are lower than IFS but ICON-GR ETS is higher. The scores for high thresholds are comparable or slightly better for ICON-GR.