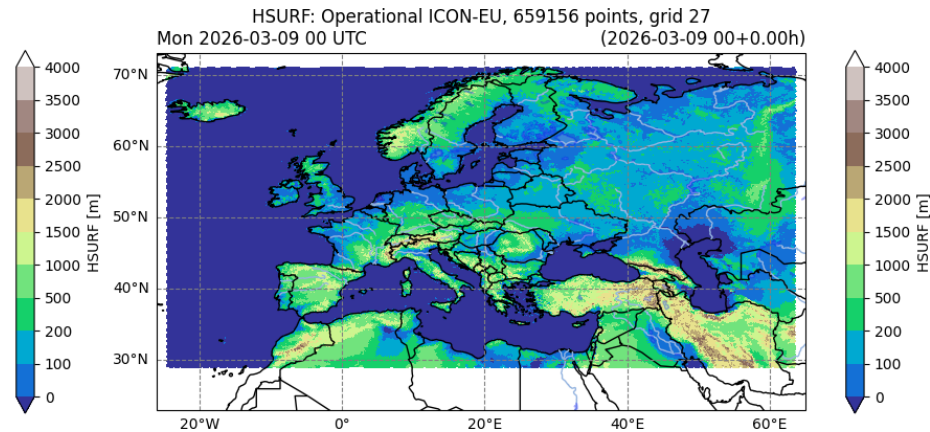
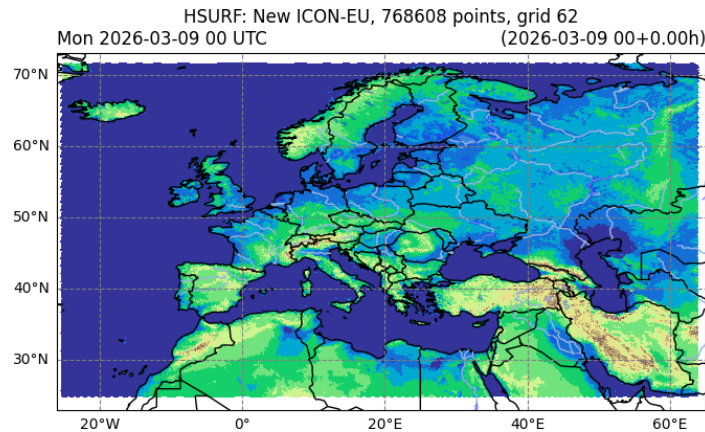


Recent Upgrade of ICON-EU-EPS: Verification Results

Christoph Gebhardt

ICON-EU-EPS new domain + increased resolution vs. ICON-EU-EPS old

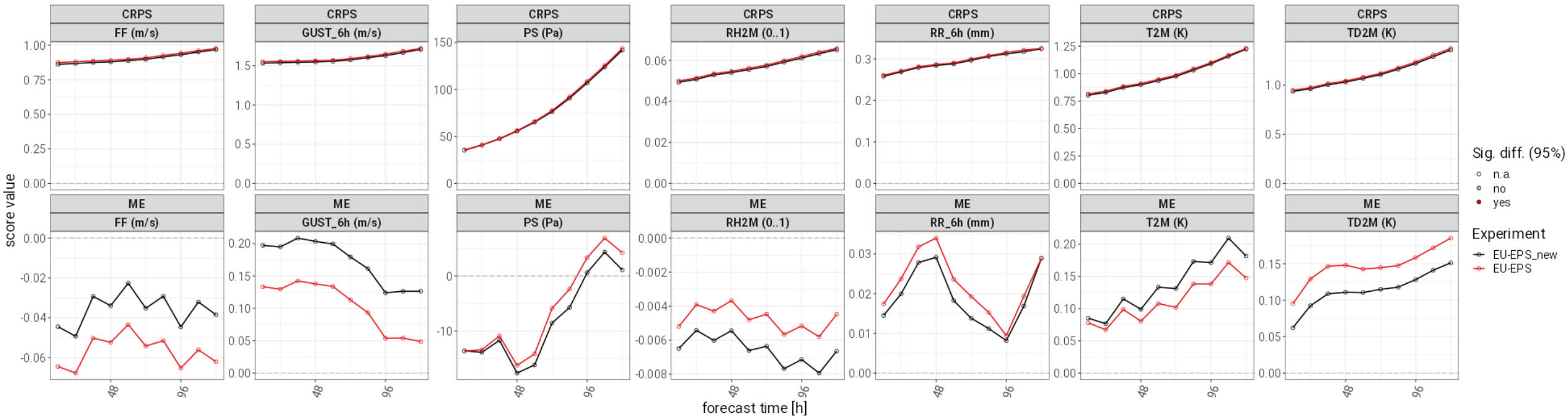


- ICON global EPS 26km → 20km nest: ICON-EU-EPS 13km → 10 km (det: 13/6.5km)
- domain increased southwards
 - ➔ Boundary/soil data for ICON-LEPS and ICON-IL at IMS
- Pre-operational since early September, operational on 6th October

ICON-EU-EPS new domain vs. old domain

2026/03/20 00UTC - 2026/09/02 12UTC

INI: ALL UTC, DOM: ALL, STAT: ALL



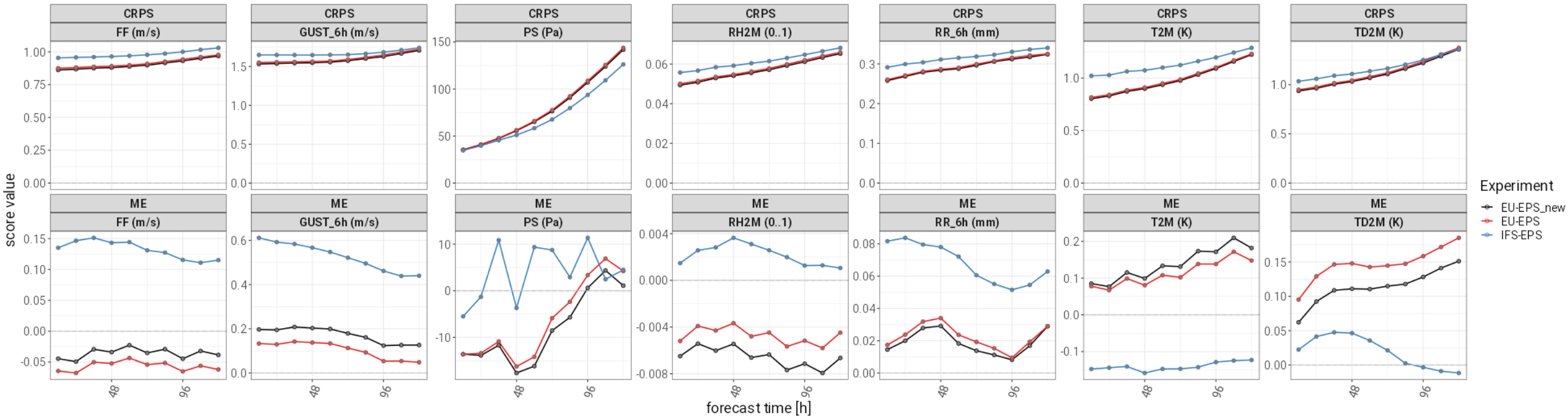
➤ Negligible difference between the new and old EU-EPS domains and resolutions.

ICON-EU-EPS vs. IFS-EPS

2026/03/20 00UTC - 2026/09/02 12UTC

INI: ALL UTC, DOM: ALL, STAT: ALL

> 5 months of scores calculated for the ,old' ICON-EU domain

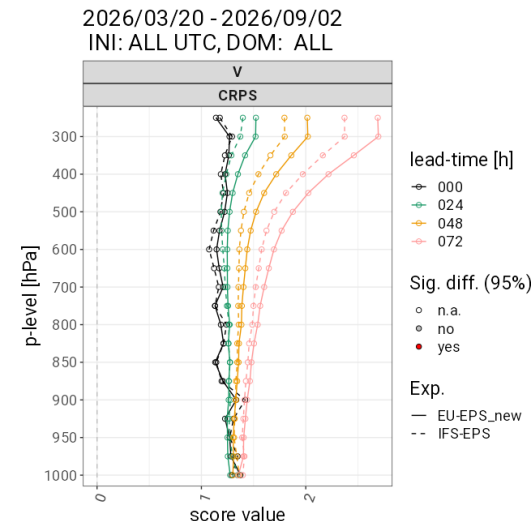
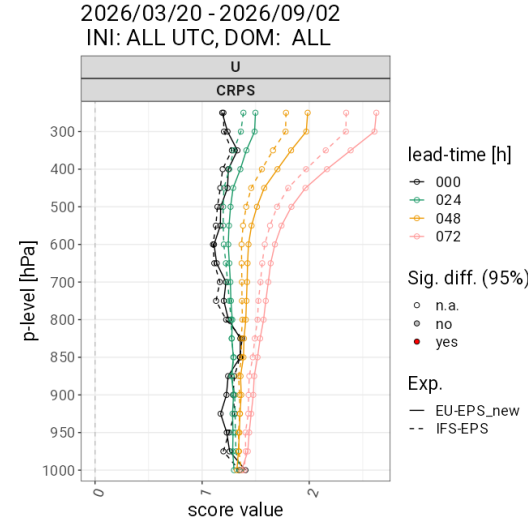
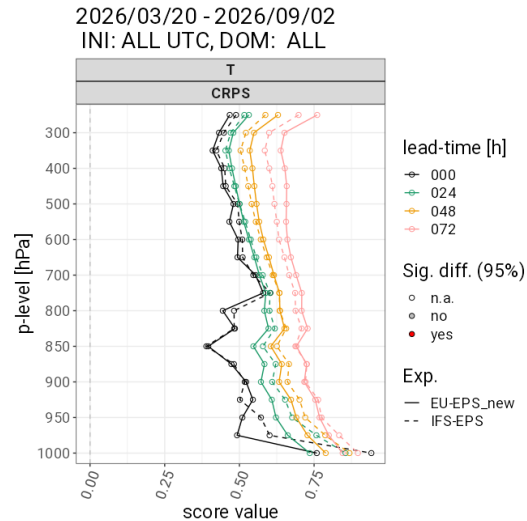


- ICON-EU-EPS has considerable better CRPS (and RMSE, not shown) than IFS-EPS for surface variables (except PS).
- Mean errors differ considerably between the two EPS systems
- Effect more relevant than the difference between the two resolutions of ICON-EU-EPS

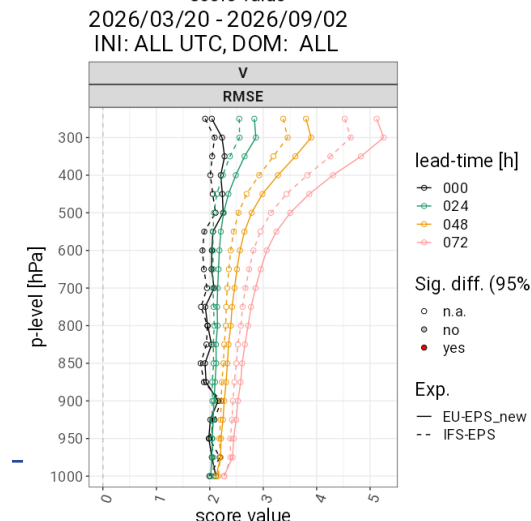
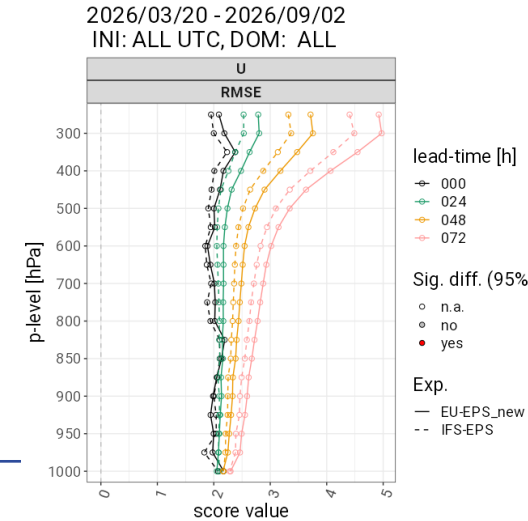
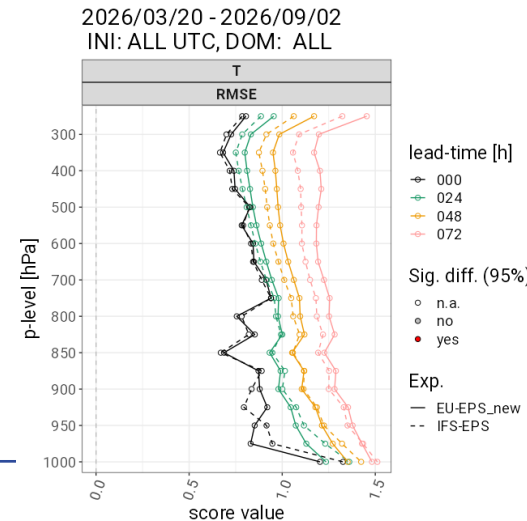
ICON-EU-EPS vs. IFS-EPS

> 5 months of scores calculated for the ,old' ICON-EU domain

CRPS



RMSE



- In the upper air verification (against AIREP), the ICON-EU-EPS is better or similar to the IFS-EPS in the boundary layer up to 48 or 72 hours (depending on variable)
- IFS-EPS has better scores above the boundary layer
- The larger the forecast lead time, the more advantages for IFS-EPS compared to ICON-EU-EPS

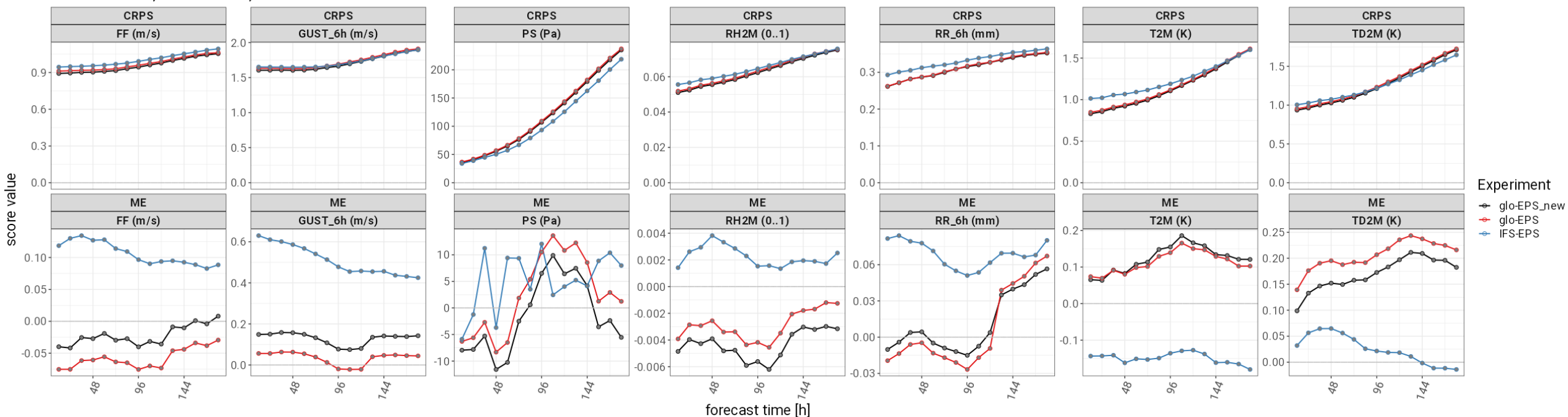


ICON-EPS global vs. IFS-EPS

2026/03/20 00UTC - 2026/09/07 00UTC

INI: ALL UTC, DOM: CEU, STAT: ALL

> 5 months of scores calculated for an European domain (former COSMO-EU)



- ICON-EPS **global** has better CRPS (and RMSE, not shown) than IFS-EPS for surface variables (except PS), but to a lesser degree than for ICON-EU-EPS
- (the upper air differences between ICON-EPS global and IFS-EPS air qualitatively similar as for ICON-EU-EPS)

Summary

- Higher resolution & larger domain:
Moving from **13 km** → **10 km** and using a larger domain had **only a limited impact** on ICON-EU-EPS forecast performance.
- The **difference between ICON-EU-EPS and IFS-EPS is more relevant**
 - ICON-EU-EPS has better scores for the boundary layer and surface variables
 - IFS-EPS is better above
- For the operational use, the availability of the runs (e.g. ICON-EU-EPS and IFS-EPS 00 UTC run) can be a criterion as well