

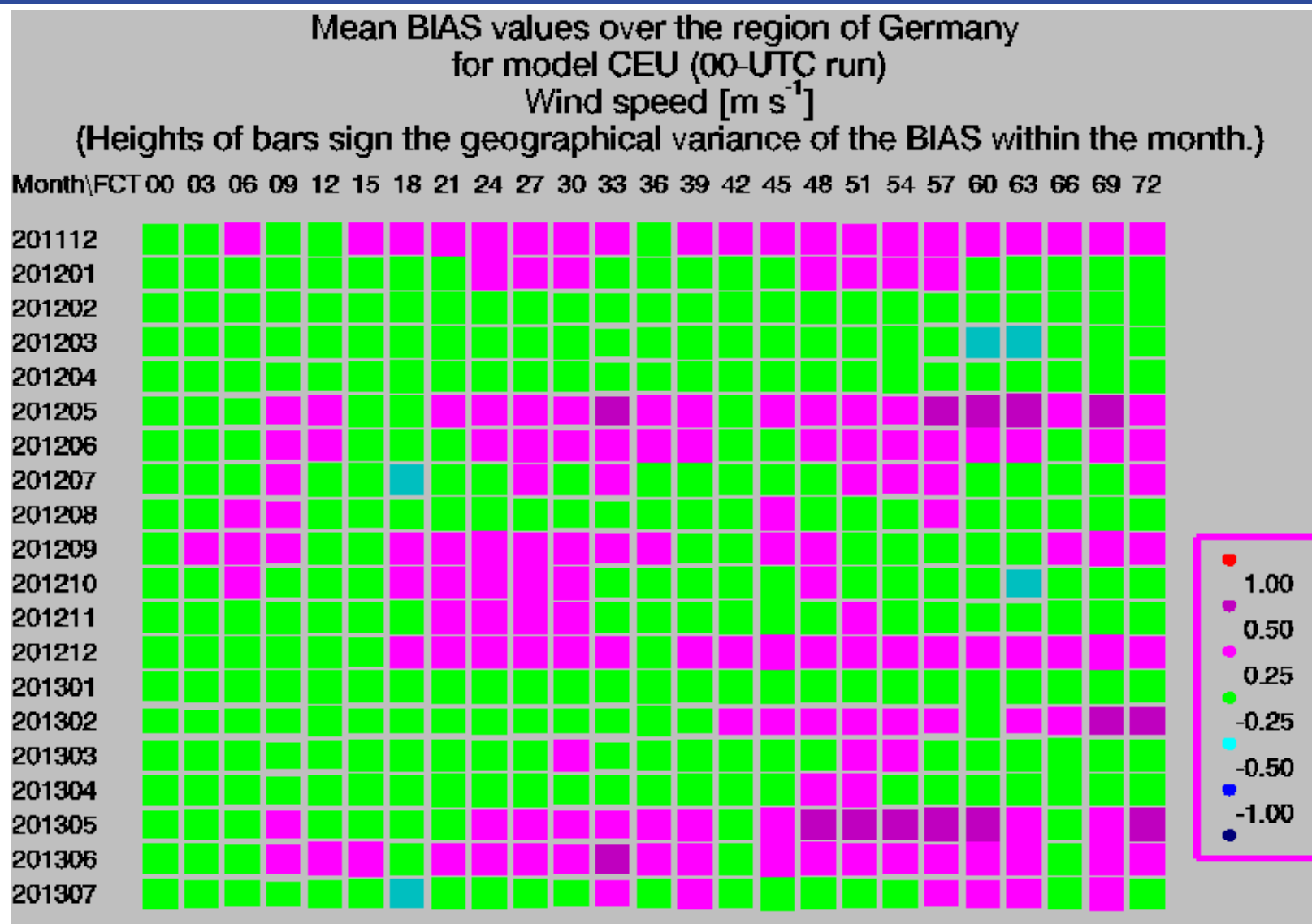
Verification at DWD – with a special look at VERSUS

Ulrich Damrath

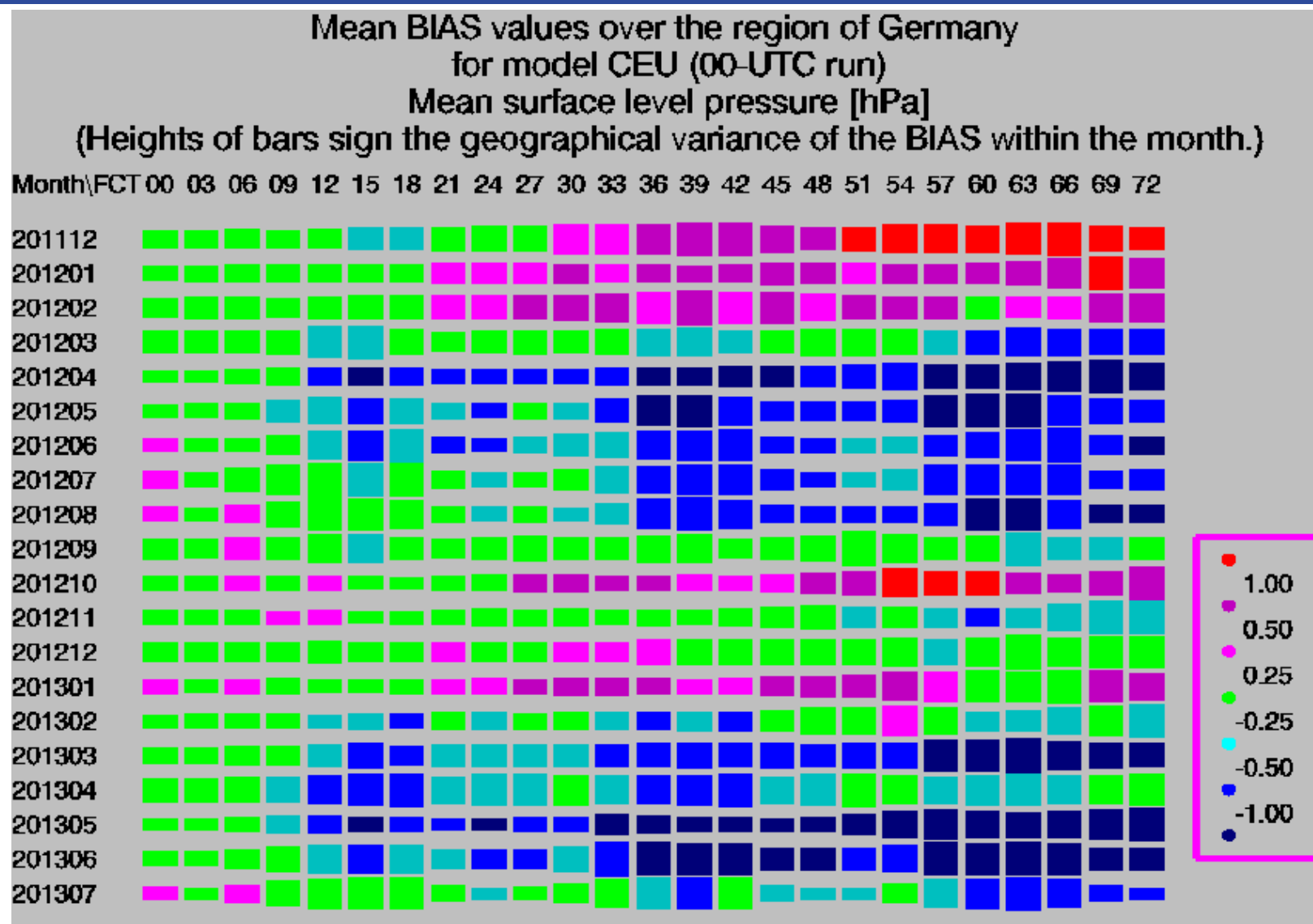
- Technical aspects
 - Version changes
 - Problems
- Results
 - Seasonal behaviour of BIAS for different surface weather elements
 - A special look on verification of total cloud cover
- VERSUS does a good job: The proof

- End of November 2012
 - Patch 07 was installed
 - Problems did not occur during installation
- March 2013: Loading of forecast data into the data base was not further possible,
 - ❖ Steps for the solution of the problem
 - ❑ Deleting data for old cases with VERSUS
 - ❑ Manual repair of the table grib using `mysql versus -u versus 'REPAIR TABLE' grib`
- Results for files including geographical distribution of the scores did not catch the wanted stratification of input data (i.e. results for German station below 800 m also contain results for stations in Switzerland, Austria, Italy ...).
 - ❖ Could be managed to a certain degree.
- Results for files with conditional verification of T2m with cloud cover in forecast space did not catch the wanted stratification
 - ❖ This is not relevant for COSMO-DE.
 - ❖ Could not be managed for COSMO-EU
- Installation of VERSUS 3.0 was not successful up to now because of conflicting prerequisites in the installation files to the DWD environment (R).
 - R installation was made by our system administrator.
 - Installation of VERSUS 3.0 will follow after the calculation of September- and JJA results.

Bias of wind speed 10m, CEU (VERSUS)



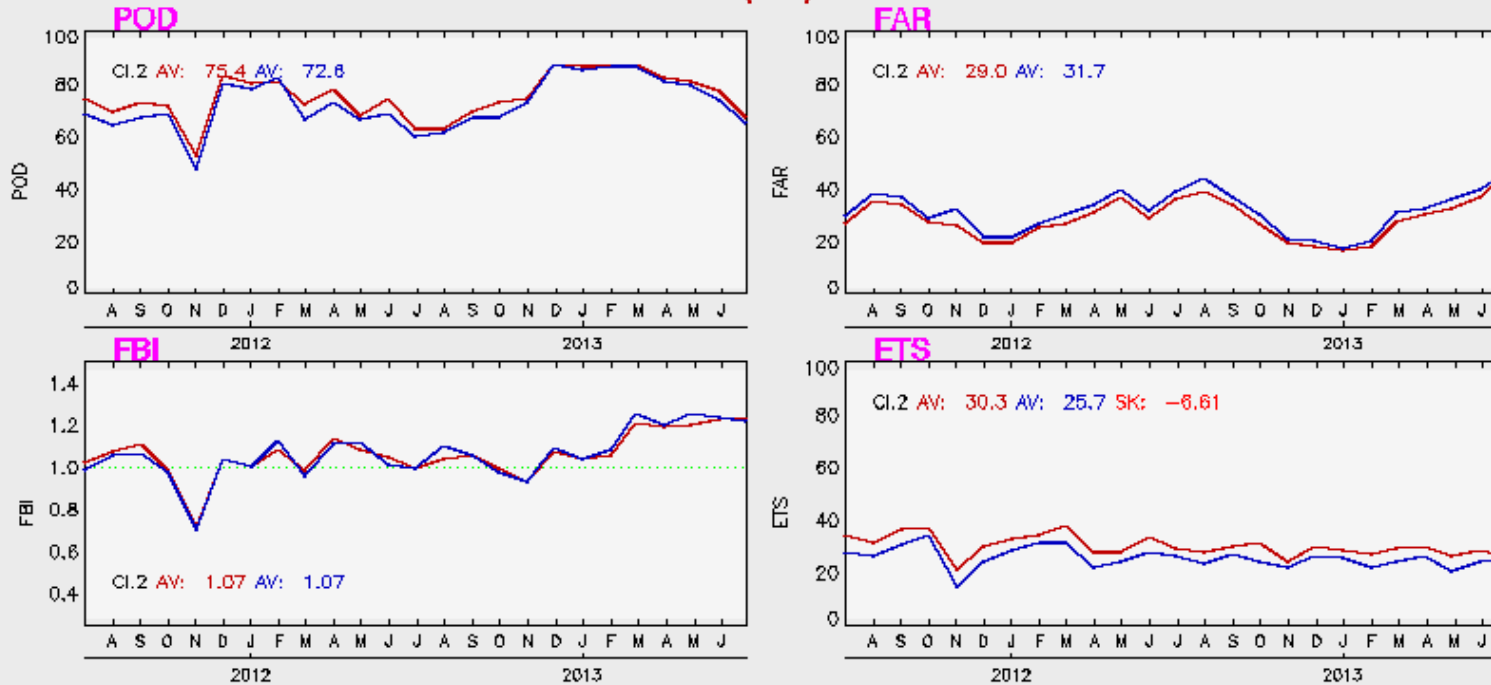
Bias of mean surface level pressure, CEU (VERSUS)



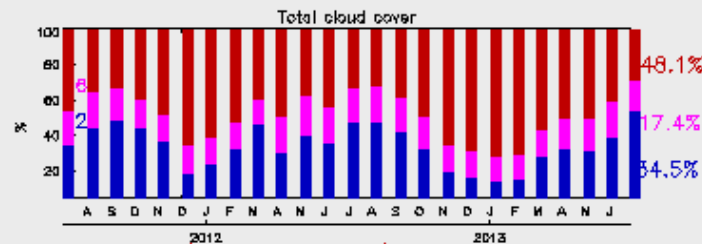
Forecast quality of total cloud cover > 6/8

Target time 00 UTC, CEU

Results of verification of forecasts for local weather elements at surface stations
 Element: **Total cloud cover (Octa)** All stations



cloud cover above 6 Octa



Basic region:
 LON: -180. - 180.
 LAT: -90. - 90.

024-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 00 UTC
 048-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 00 UTC

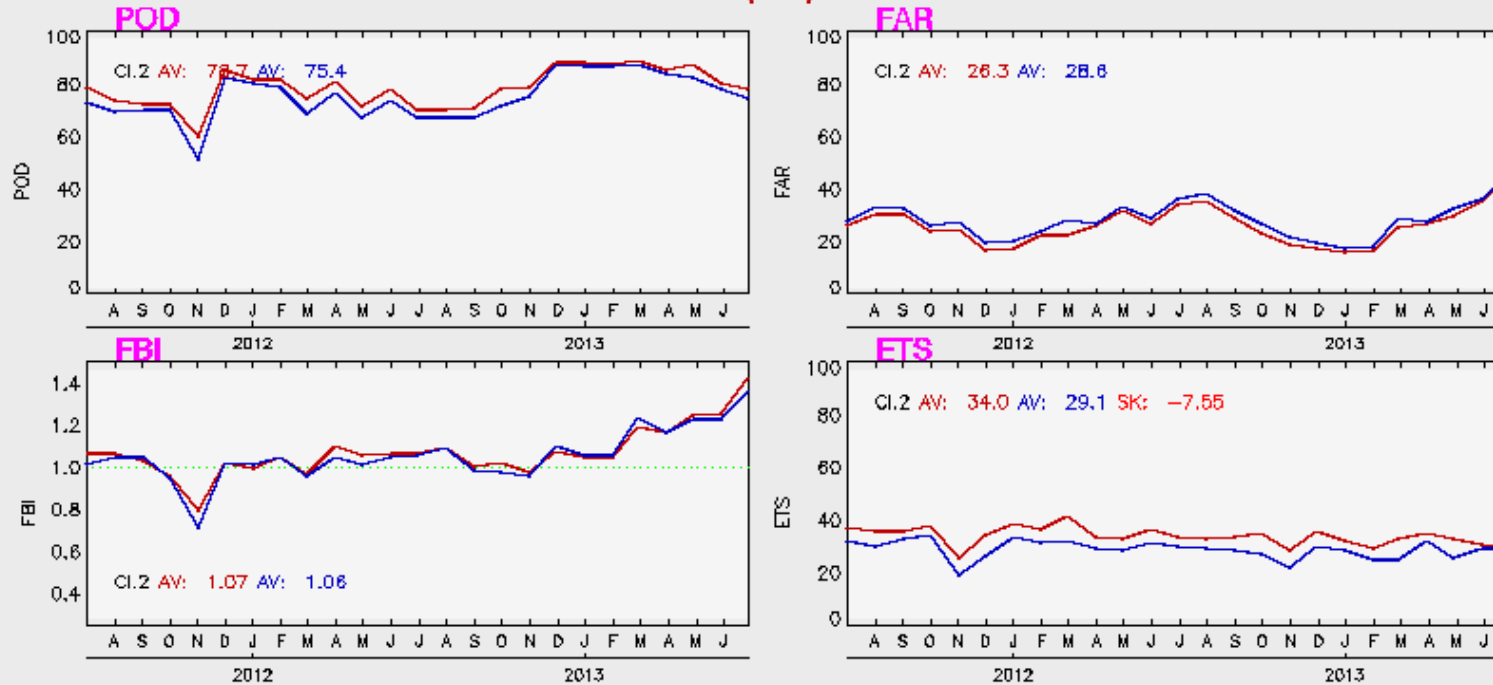
Plattime: 19.08.2013 15:28:58 MESZ



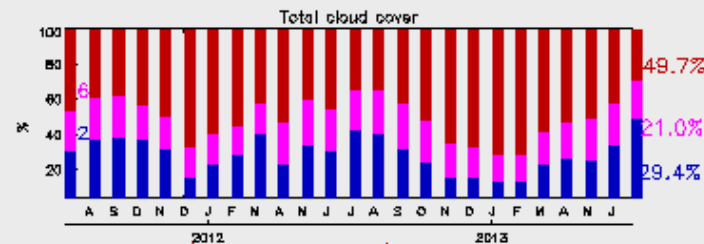
Forecast quality of total cloud cover > 6/8

Target time 06 UTC, CEU

Results of verification of forecasts for local weather elements at surface stations
 Element: **Total cloud cover (Octa)** All stations



cloud cover above 6 Octa



Basic region:
 LON: -180. - 180.
 LAT: -90. - 90.

018-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 06 UTC
 042-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 06 UTC

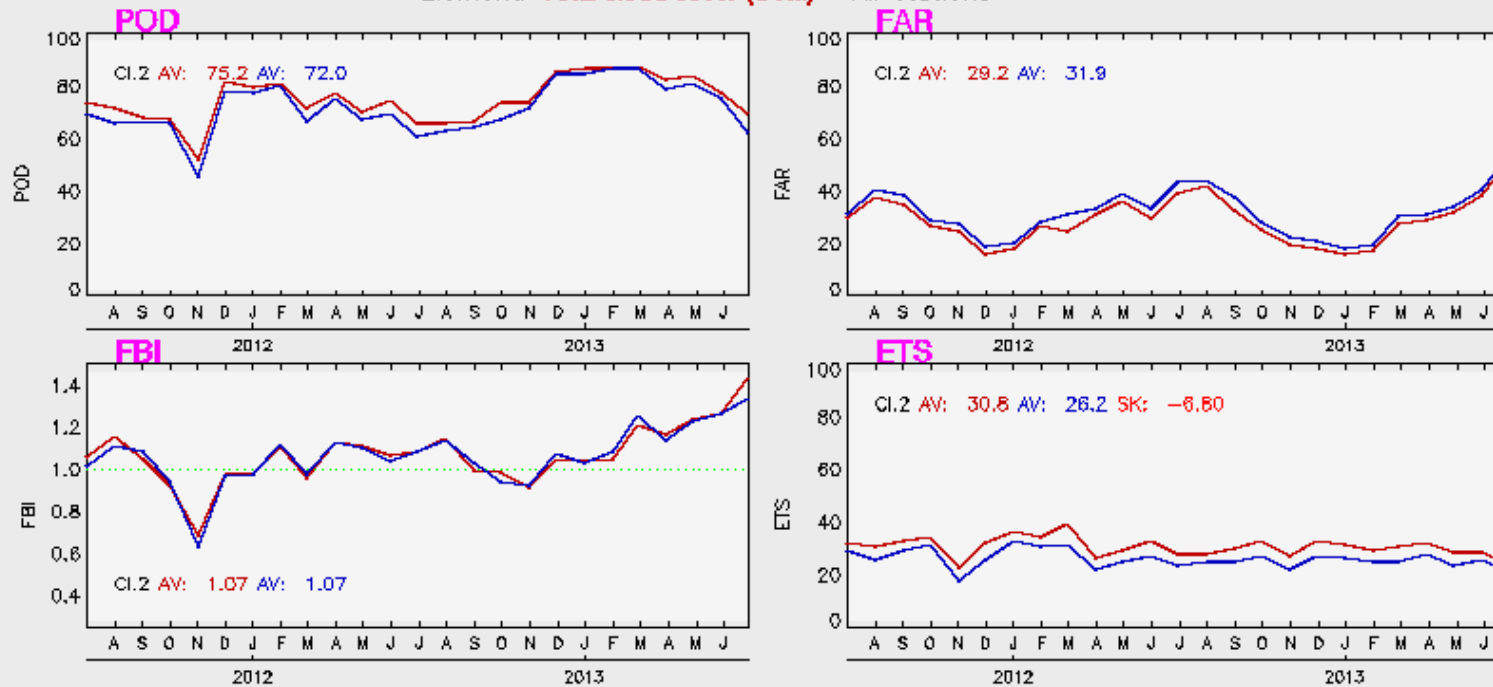
Plattime: 19.08.2013 15:26:44 MESZ



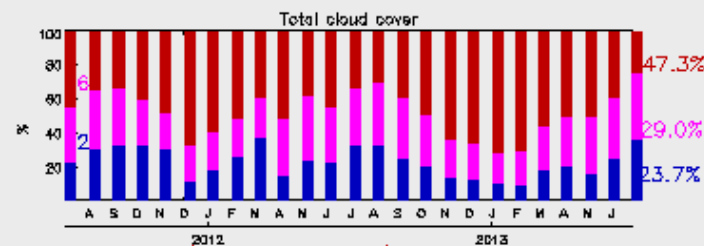
Forecast quality of total cloud cover > 6/8

Target time 12 UTC, CEU

Results of verification of forecasts for local weather elements at surface stations
 Element: **Total cloud cover (Octa)** All stations



cloud cover above 6 Octa



Basic region:
 LON: -180. - 180.
 LAT: -90. - 90.

024-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 12 UTC
 048-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 12 UTC

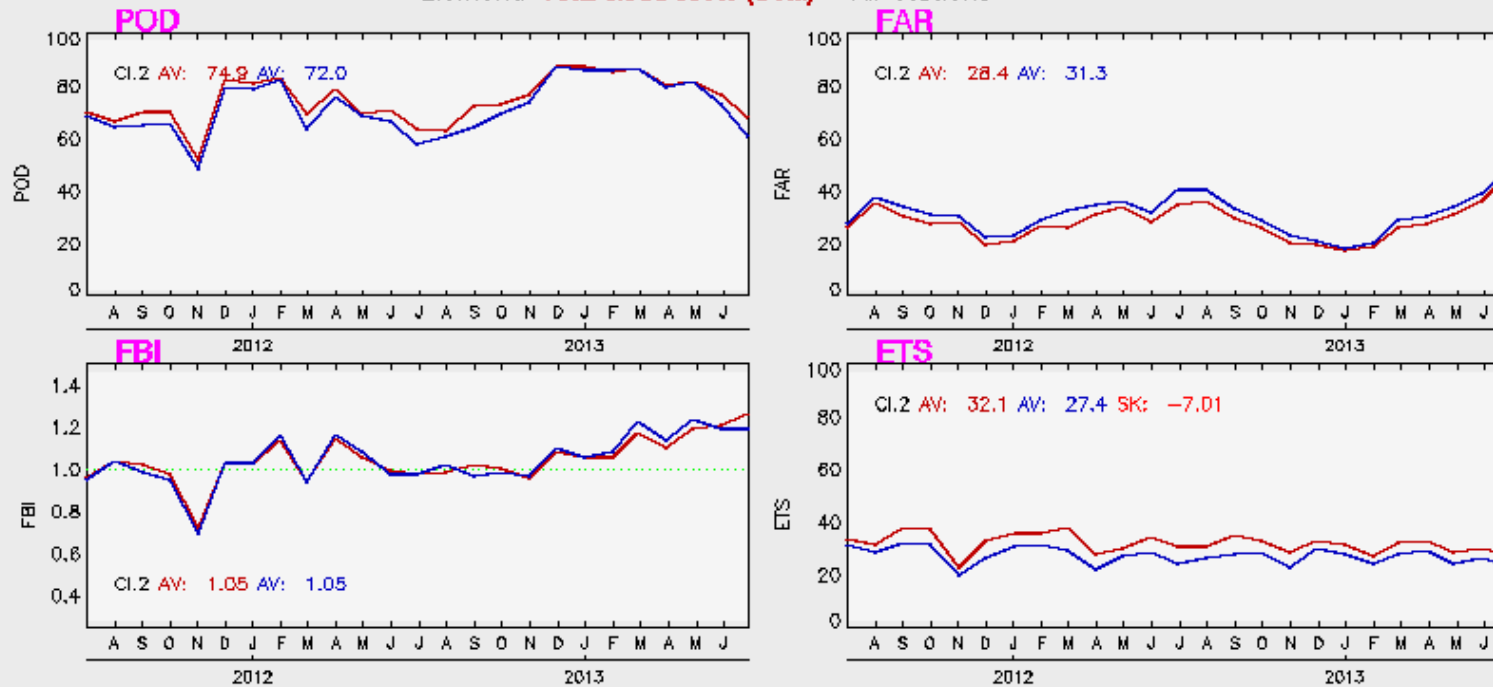
Platttime: 19.08.2013 15:30:30 MESZ



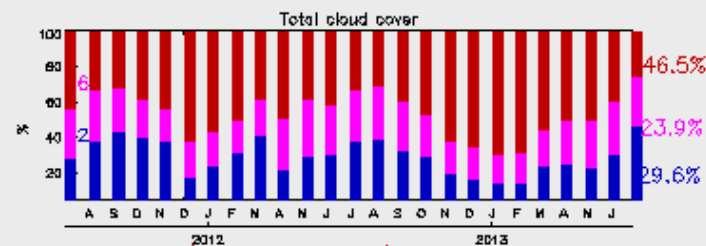
Forecast quality of total cloud cover > 6/8

Target time 18 UTC, CEU

Results of verification of forecasts for local weather elements at surface stations
 Element: **Total cloud cover (Octa)** All stations



cloud cover above 6 Octa



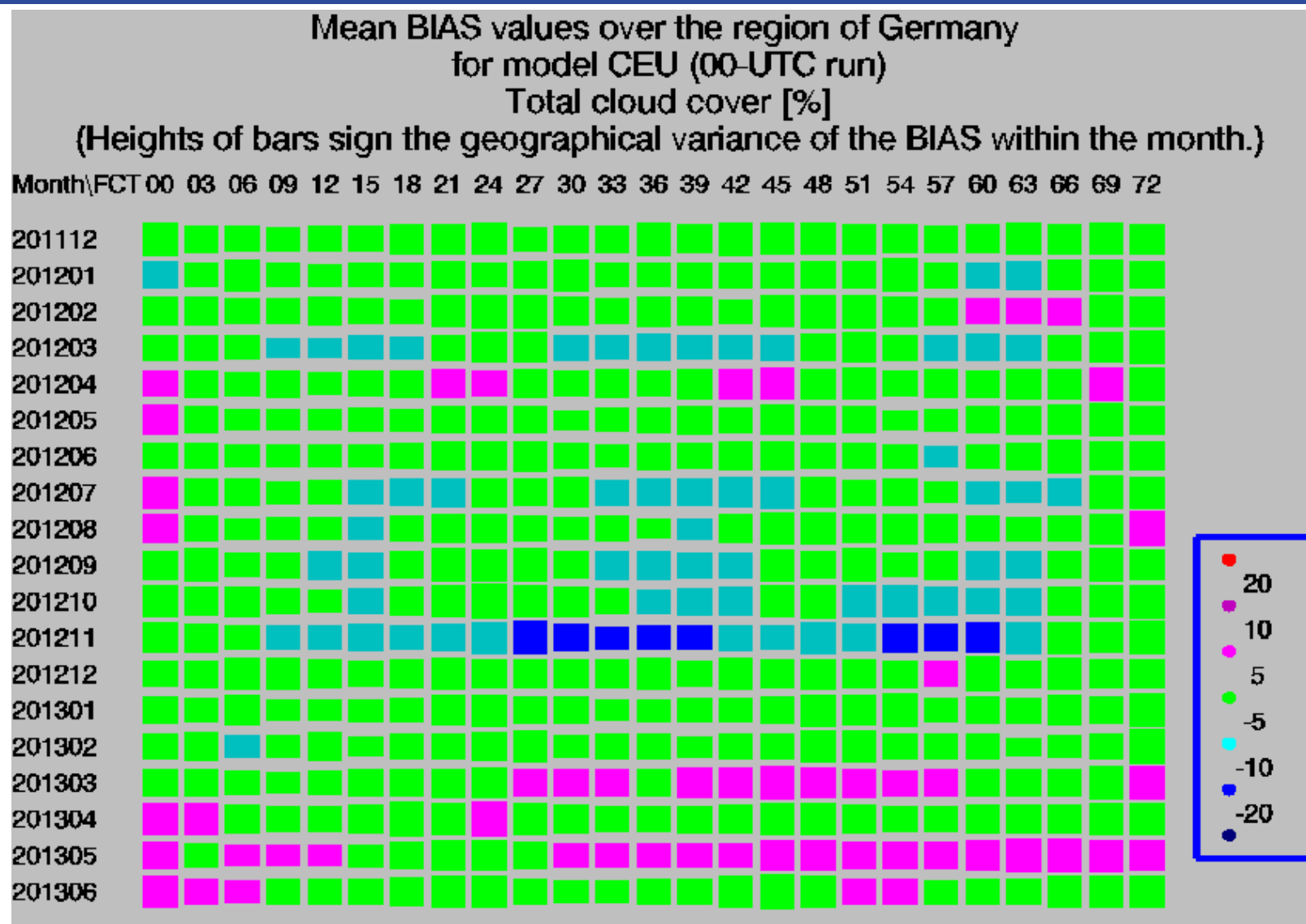
Basic region:
 LON: -180. - 180.
 LAT: -90. - 90.

018-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 18 UTC
 042-h-forecasts of COSMO-EU from July 2011 till July 2013 valid 18 UTC

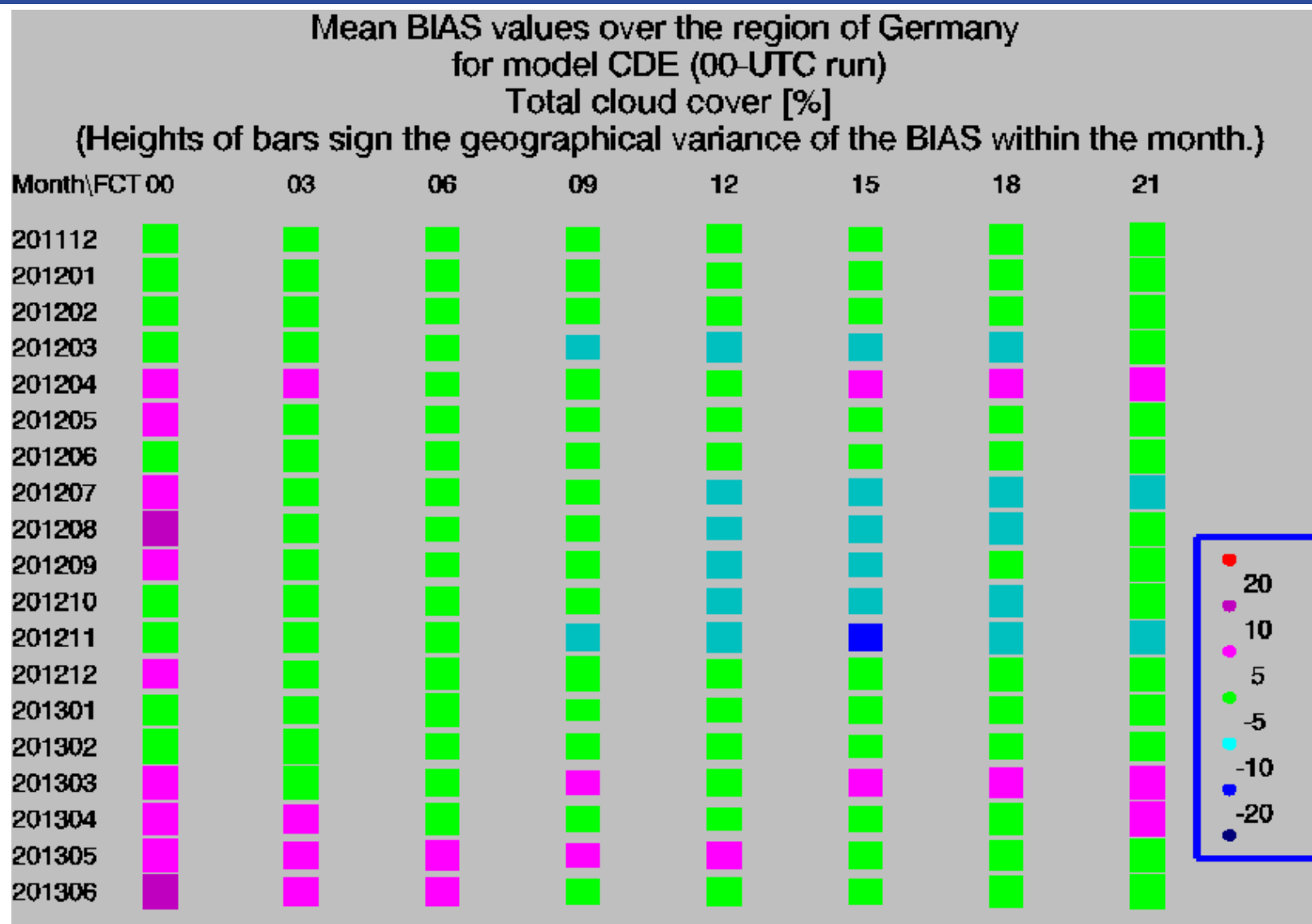
Plattime: 19.08.2013 15:27:48 MESZ



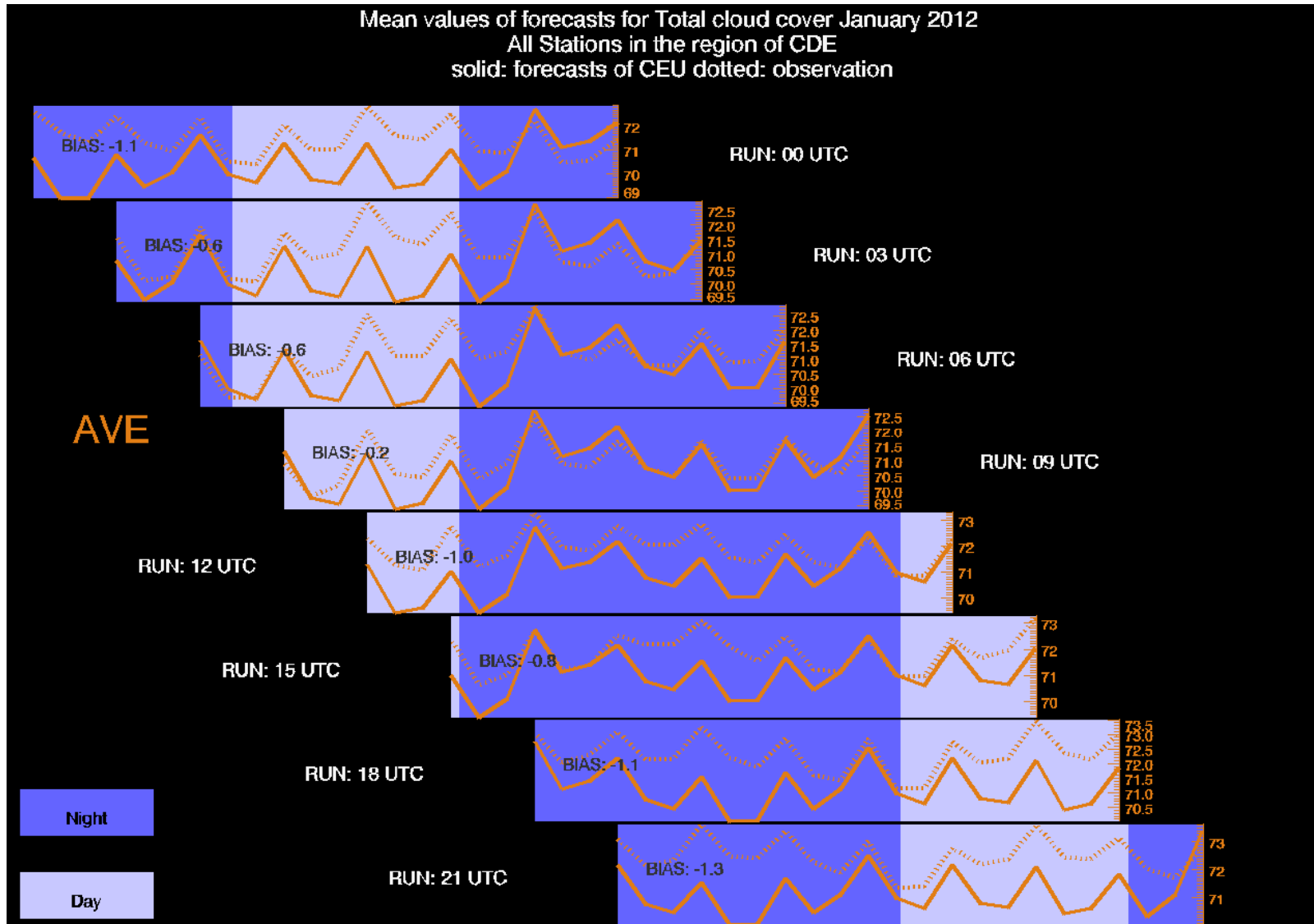
Bias of total cloud cover, CEU (VERSUS)



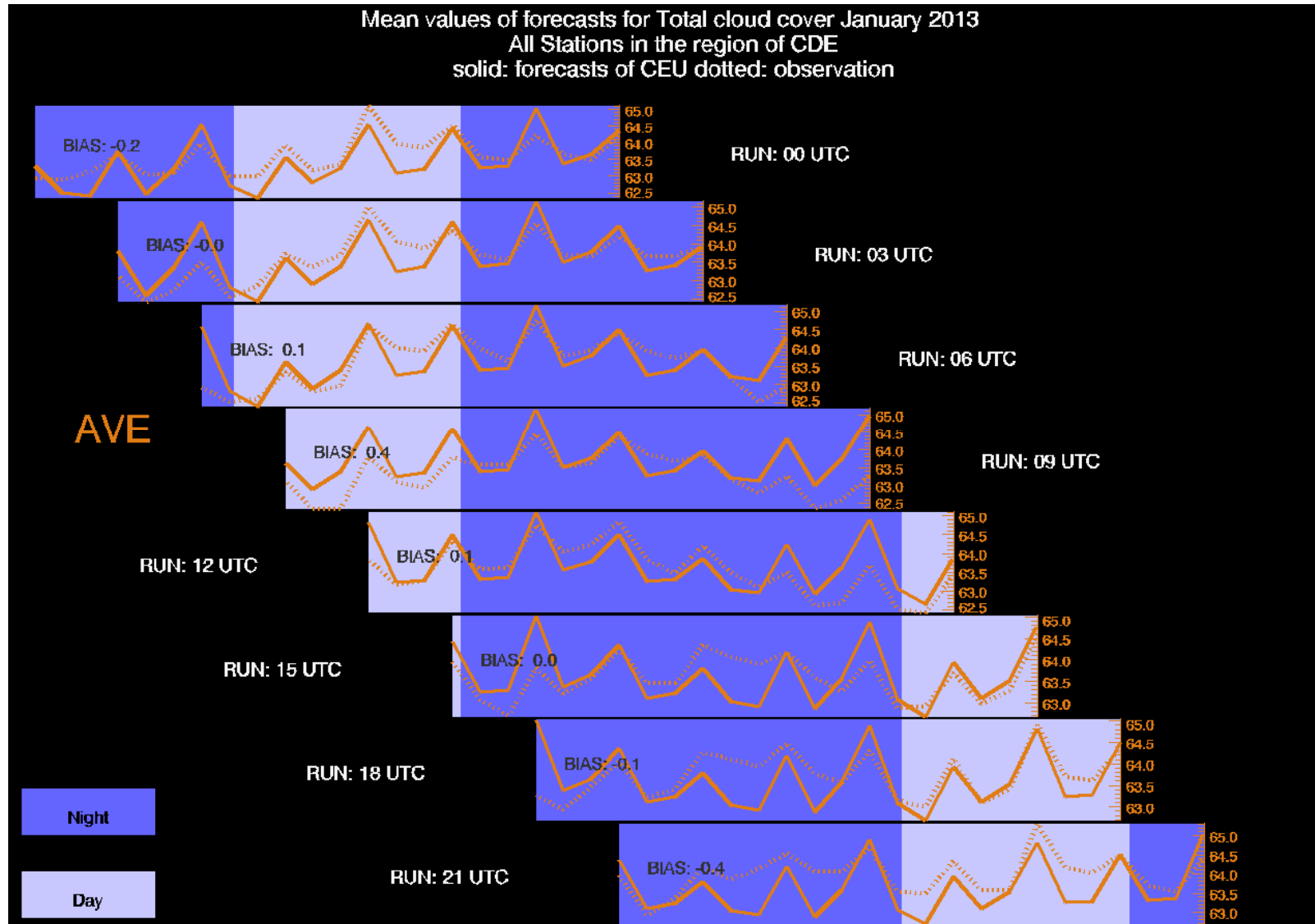
Bias of total cloud cover, CDE (VERSUS)



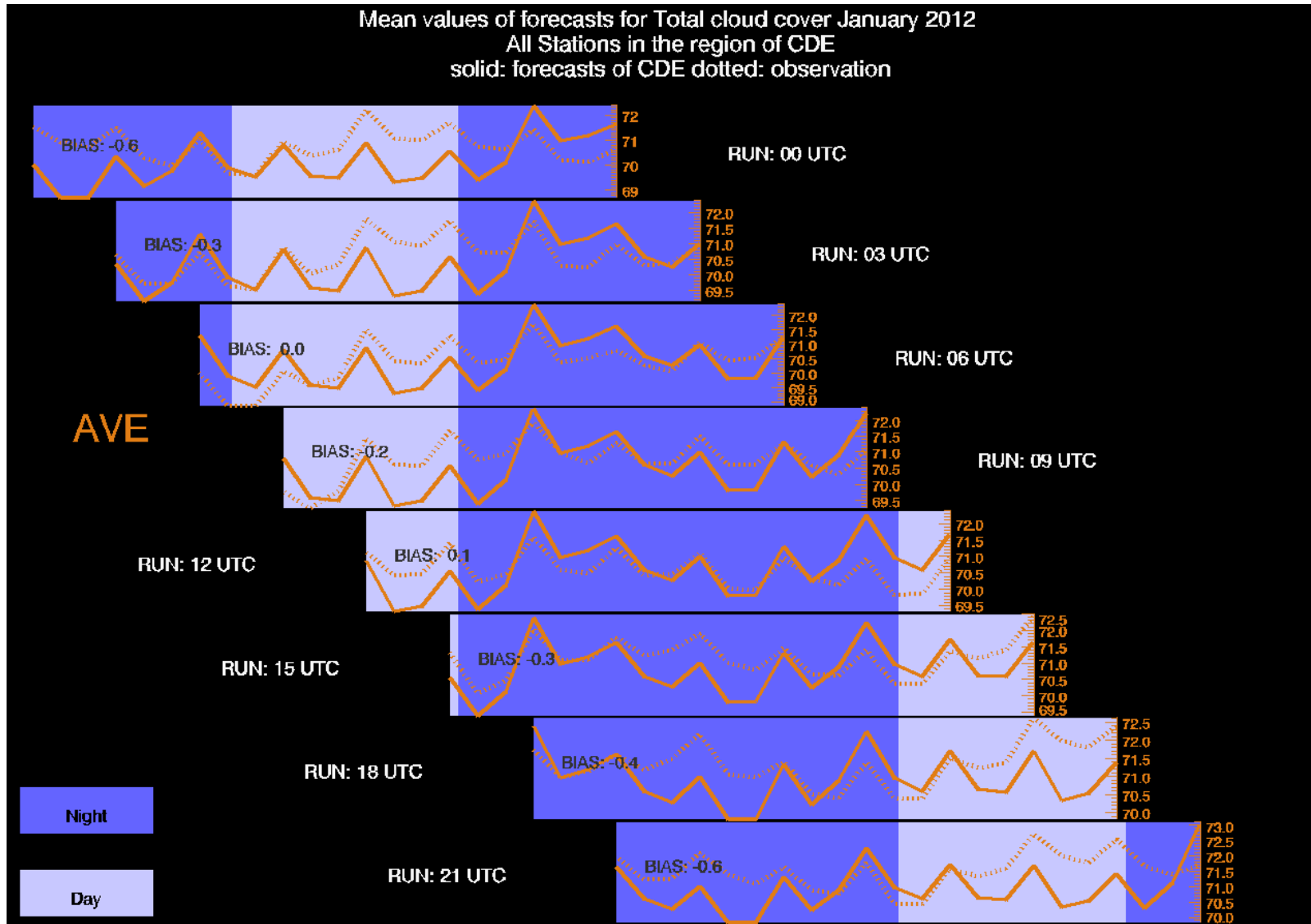
mean values Total cloud cover January 2012, CEU (standard verification at DWD)



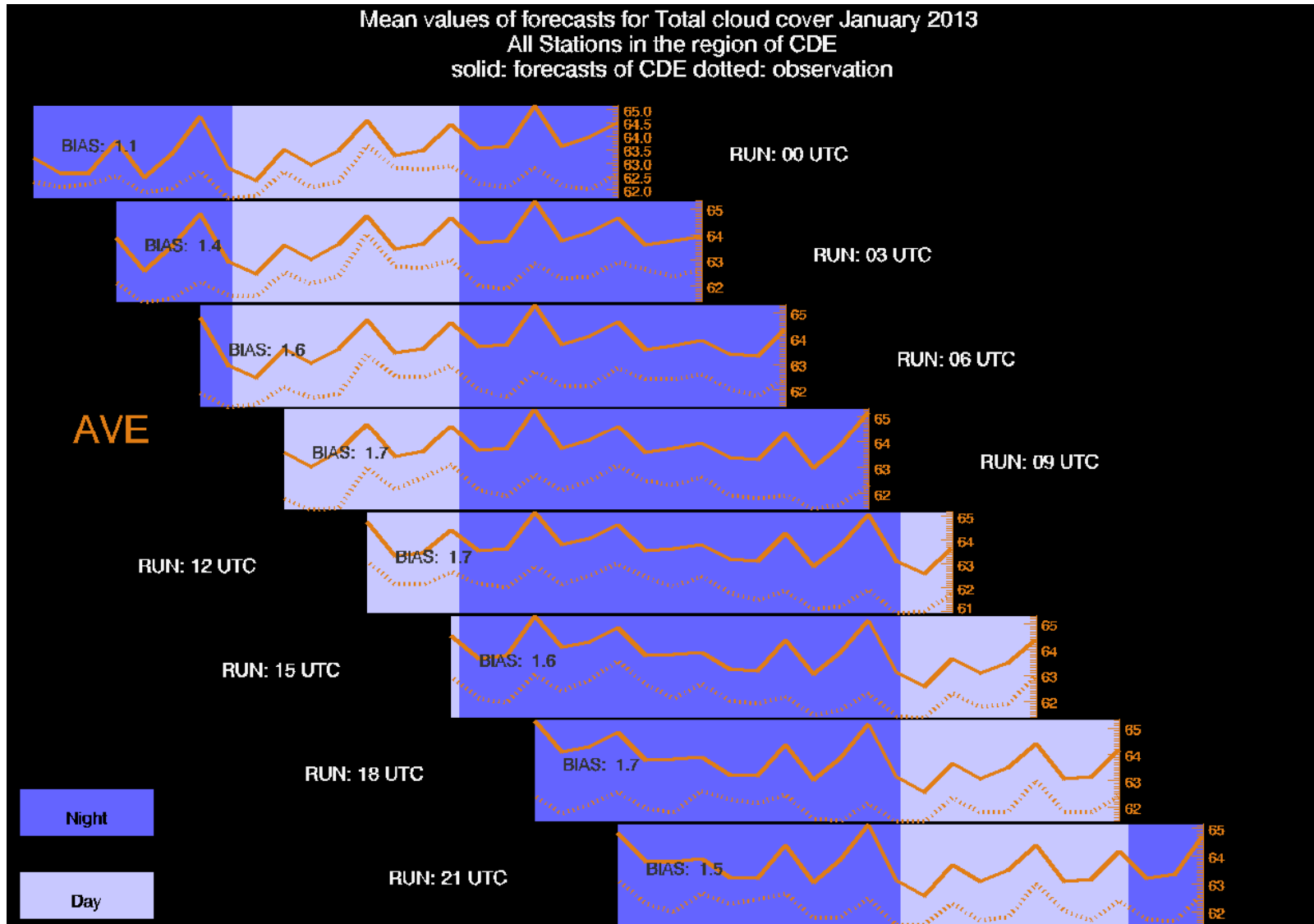
mean values Total cloud cover January 2013, CEU (standard verification at DWD)



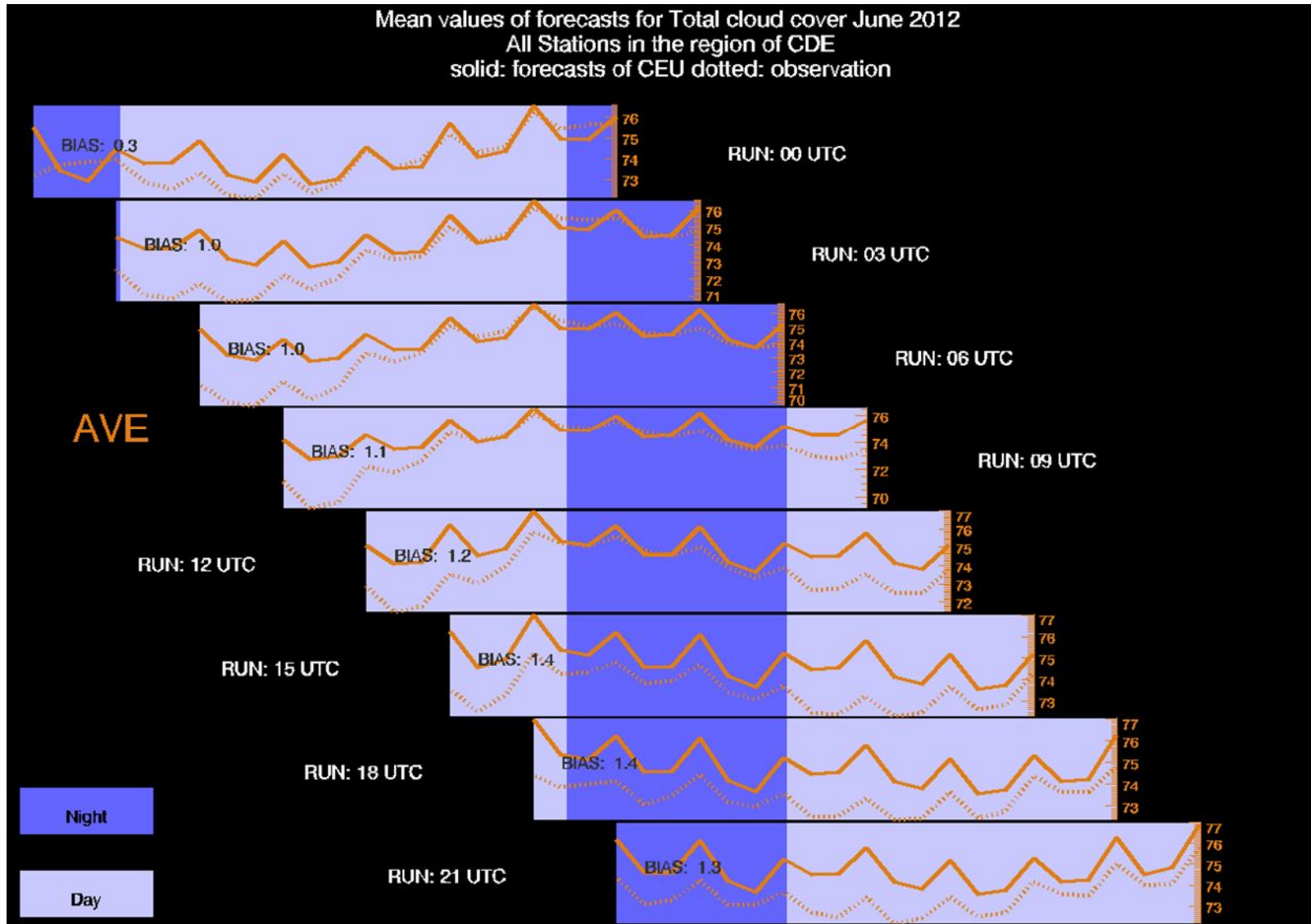
mean values Total cloud cover January 2012, CDE (standard verification at DWD)



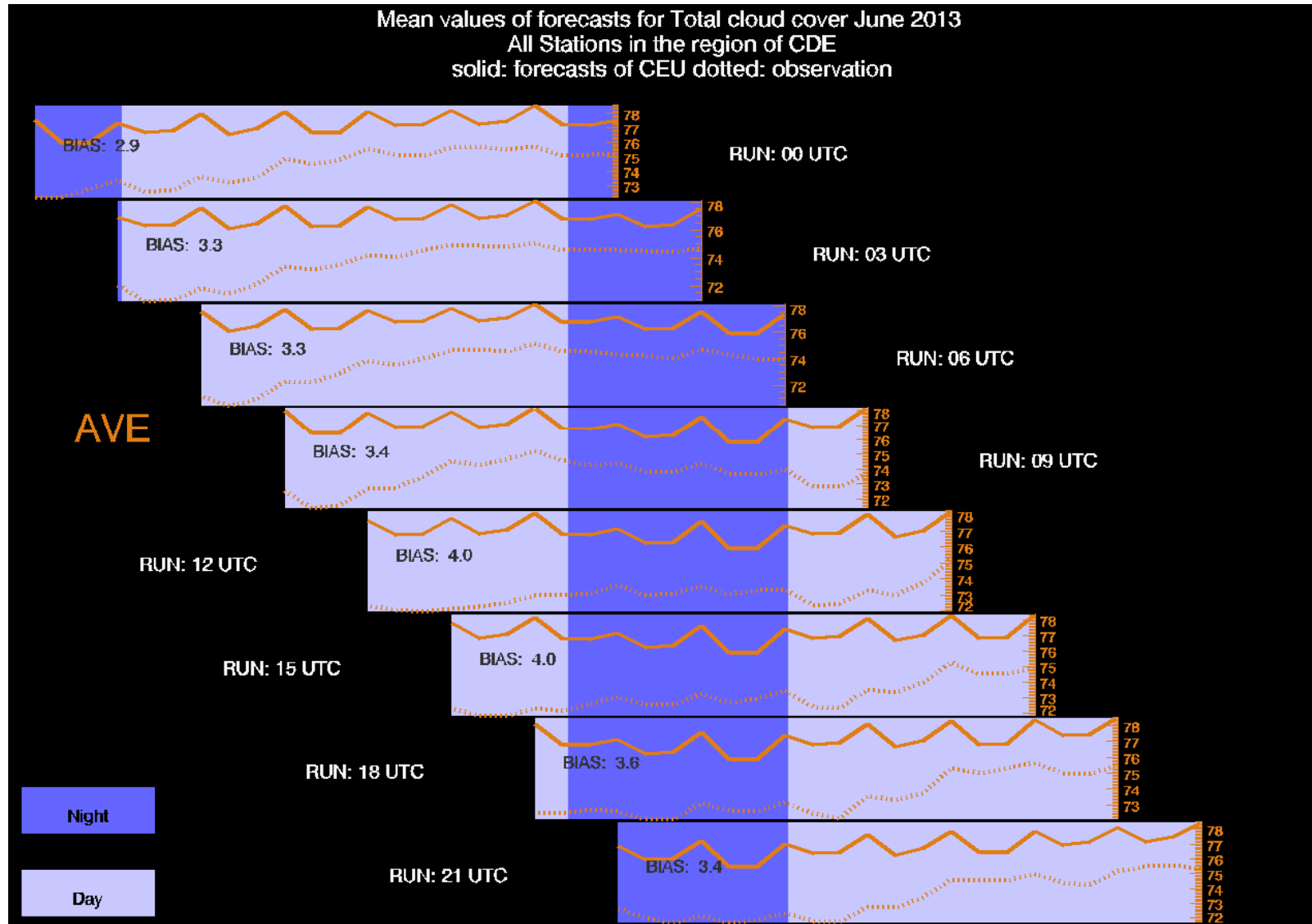
mean values Total cloud cover January 2013, CDE (standard verification at DWD)



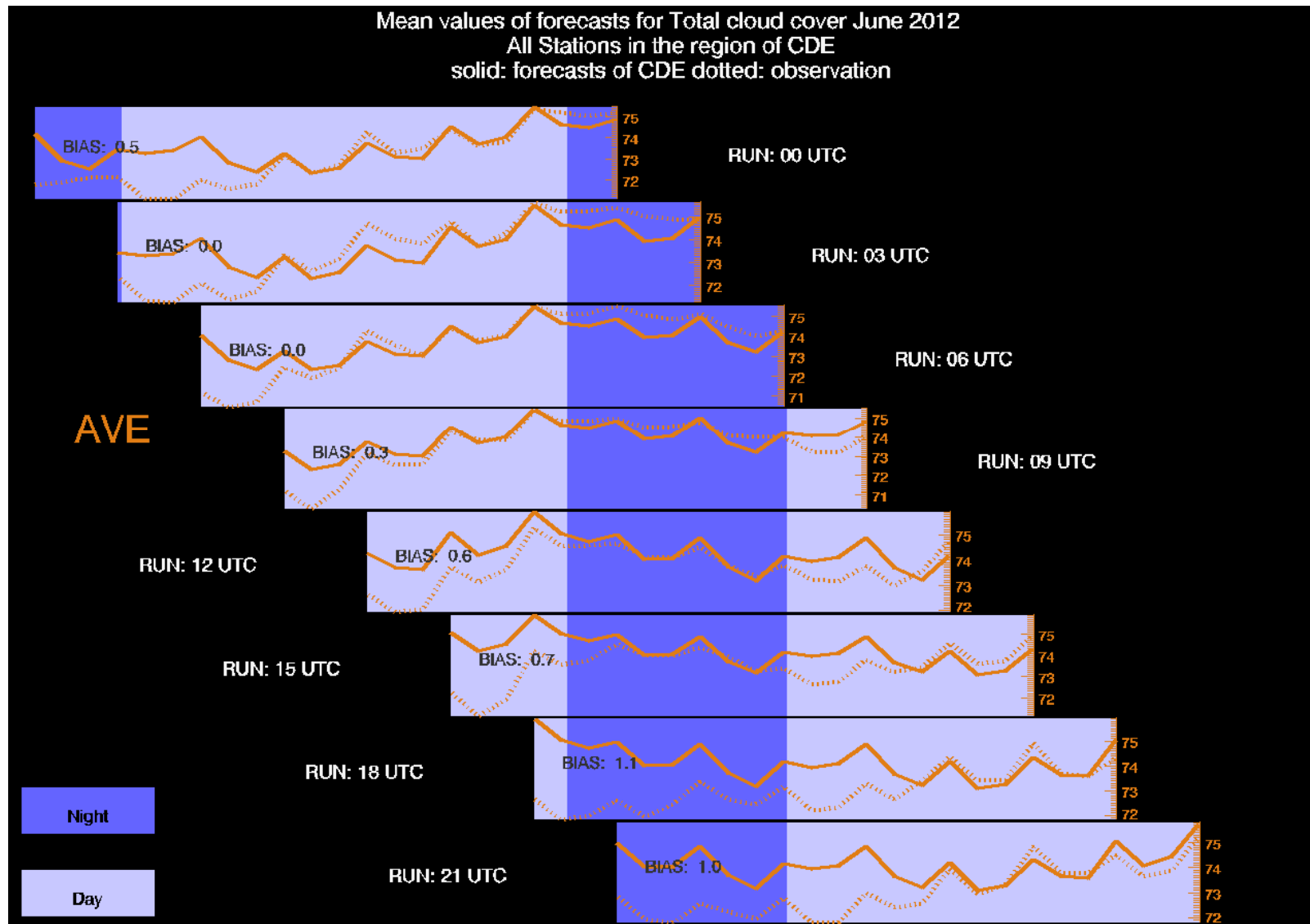
mean values Total cloud cover June 2012, CEU (standard verification at DWD)



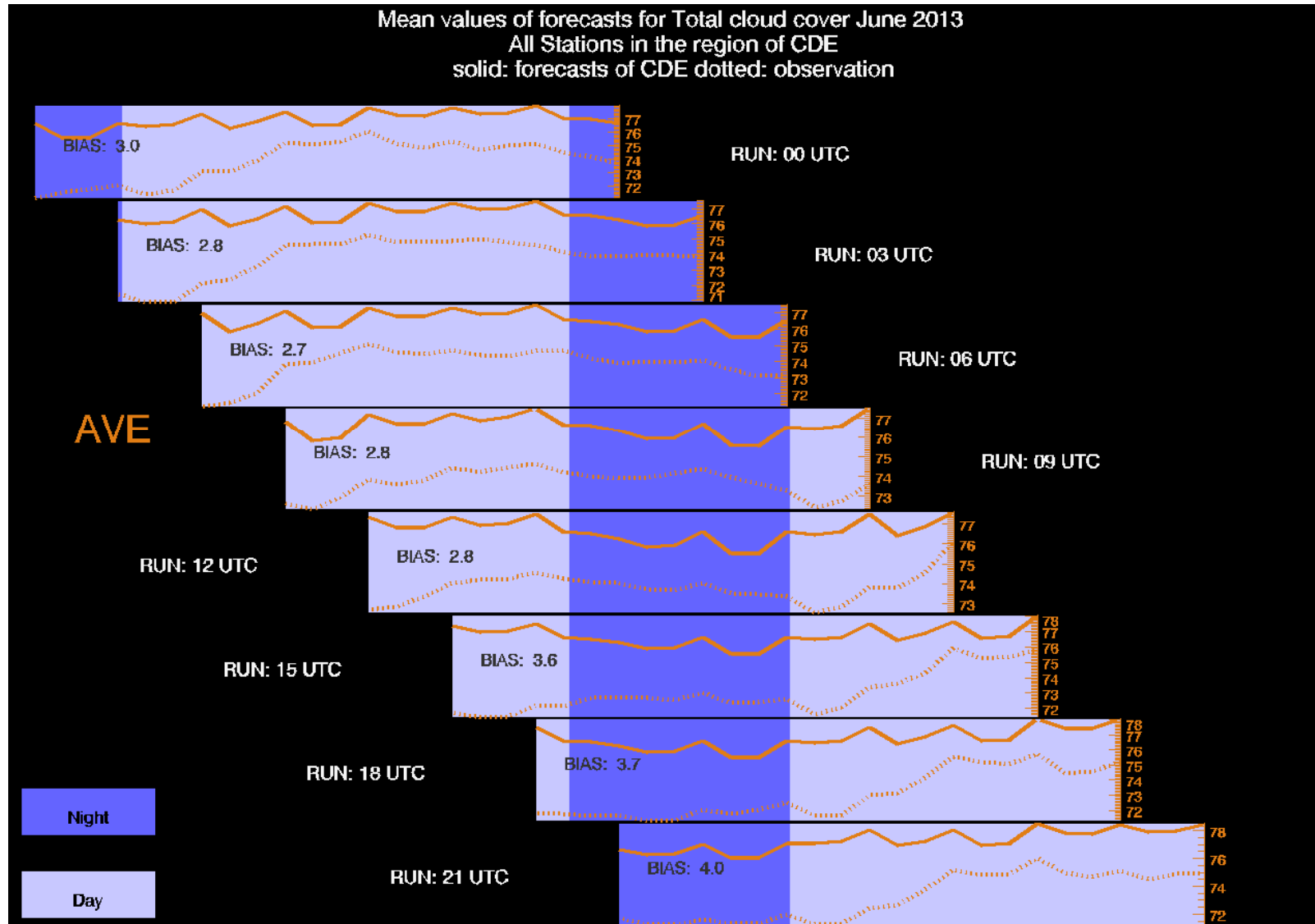
mean values Total cloud cover June 2013, CEU (standard verification at DWD)



mean values Total cloud cover June 2012, CDE (standard verification at DWD)



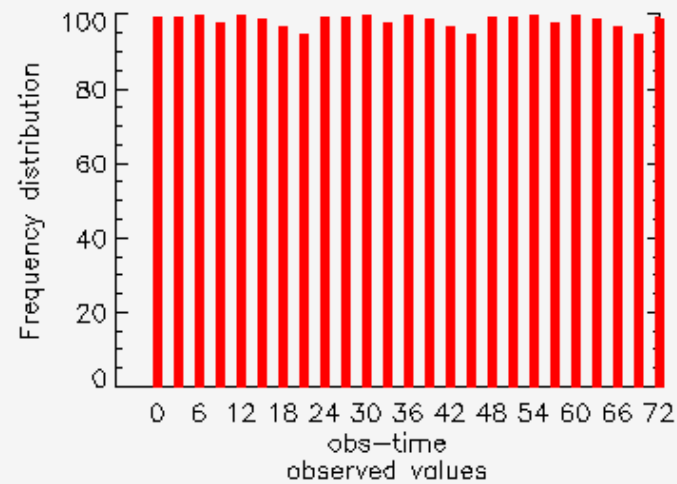
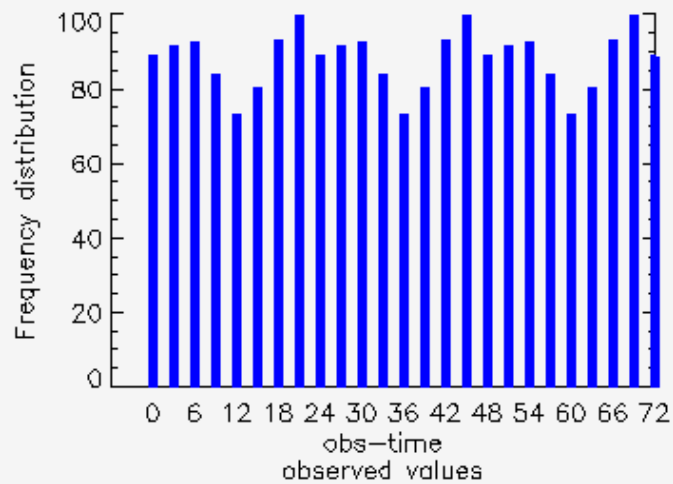
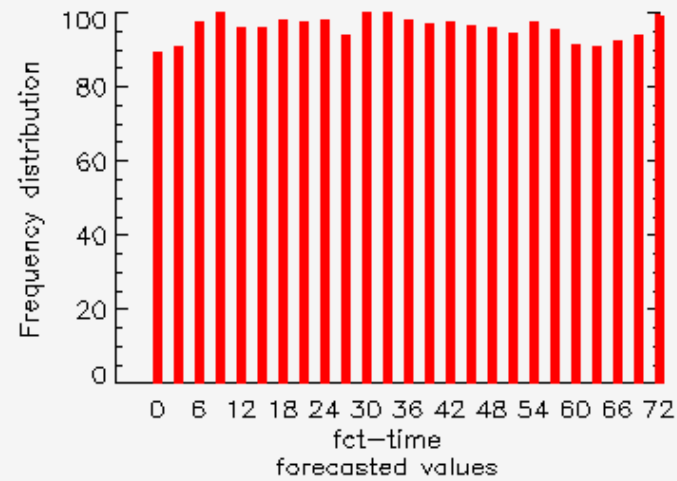
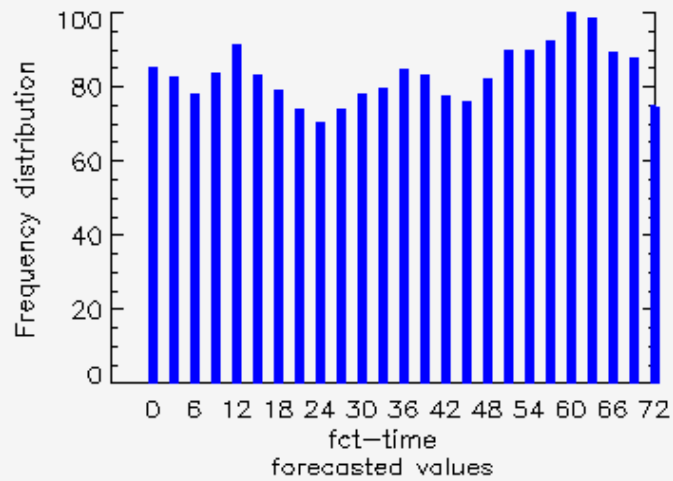
mean values Total cloud cover June 2013, CDE (standard verification at DWD)



Frequency distribution of low and high cloud covers January 2012, CEU (VERSUS)

Monthly verification CEU Temperature 2m - 00 Run cases with TTC < 25% cases with TTC > 75%

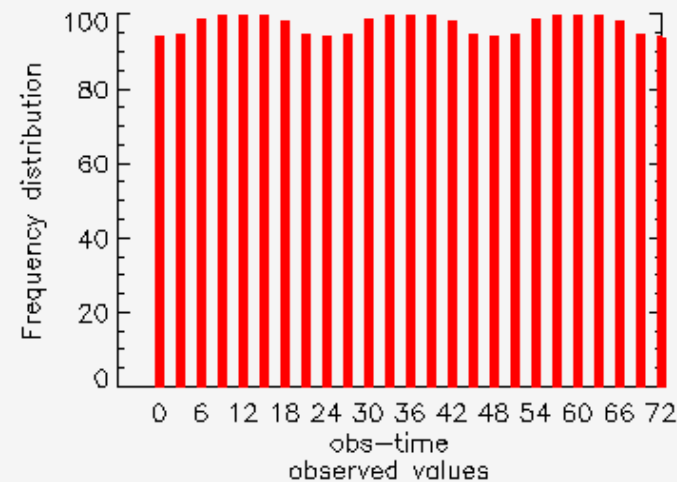
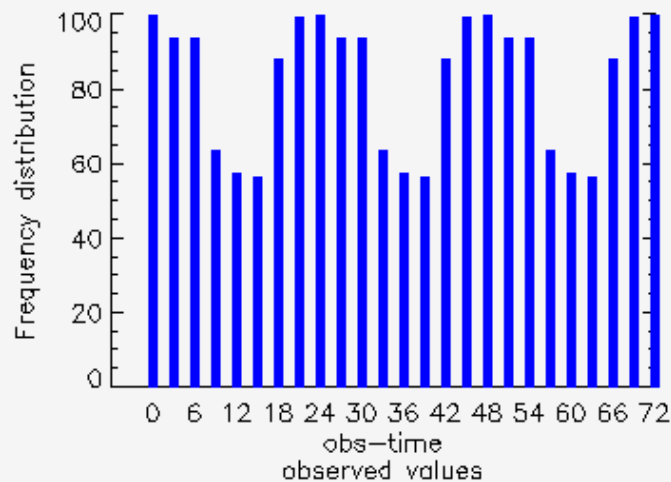
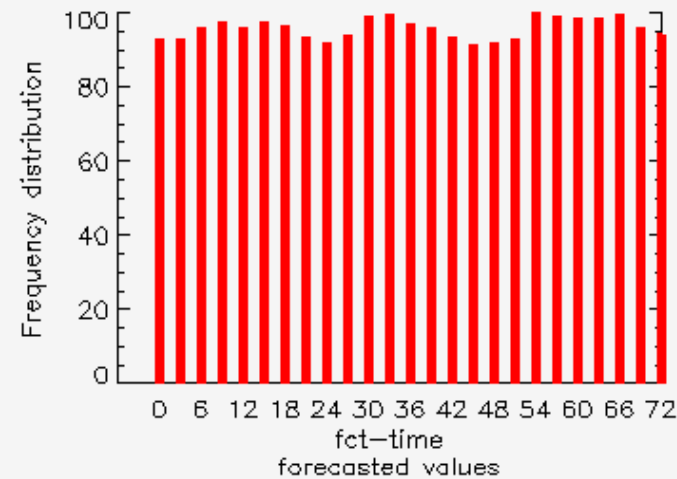
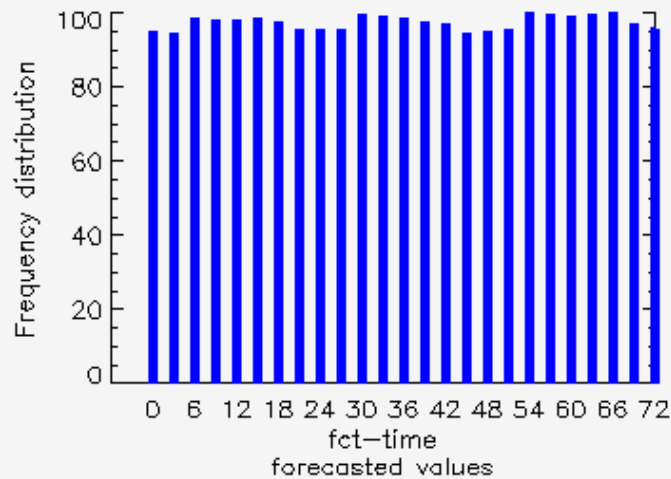
Stratification: German stations below 800m - Period: 2012-01-01 - 2012-01-31



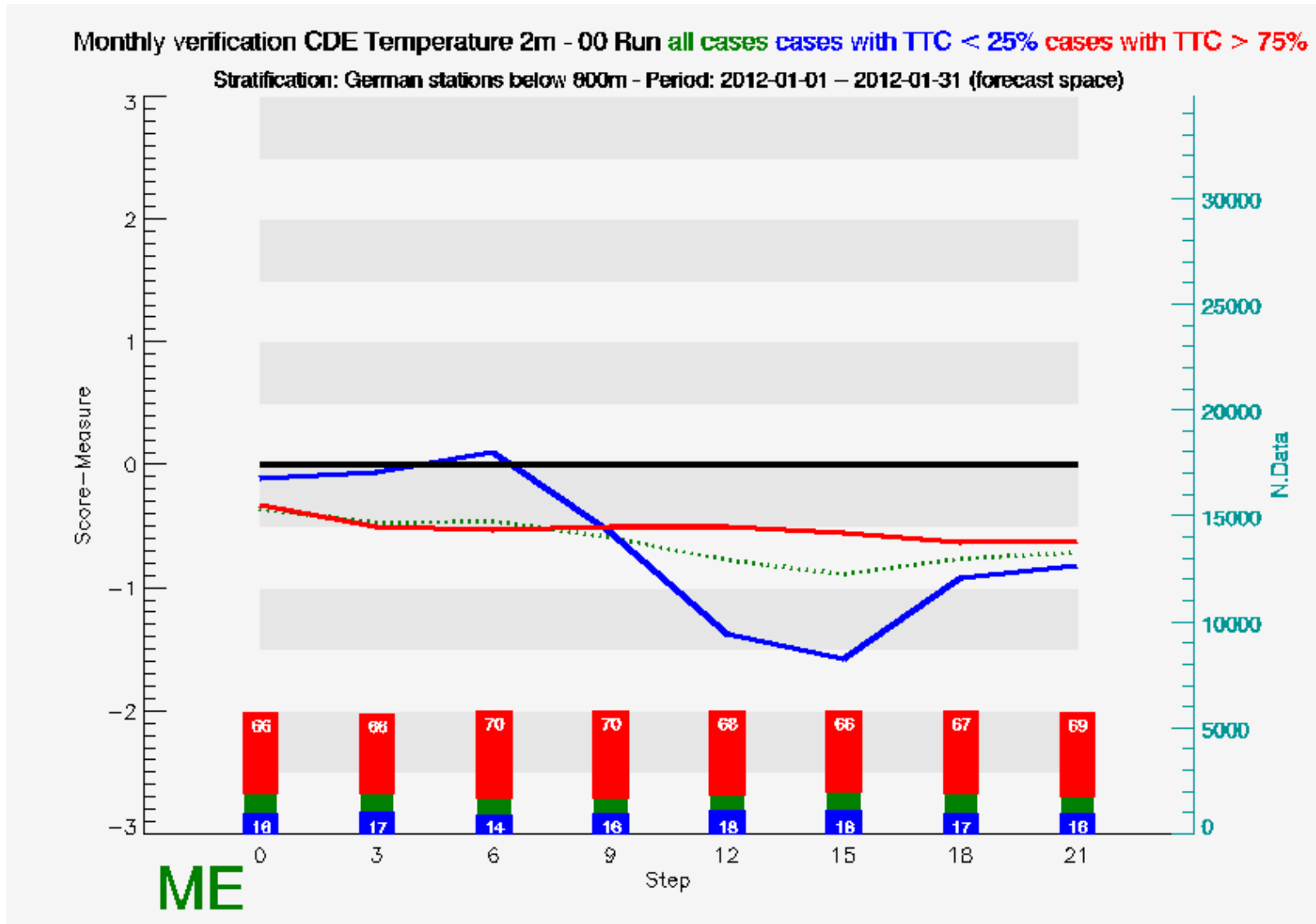
Frequency distribution of low and cloud covers January 2013, CEU (VERSUS)

Monthly verification CEU Temperature 2m - 00 Run cases with TTC < 25% cases with TTC > 75%

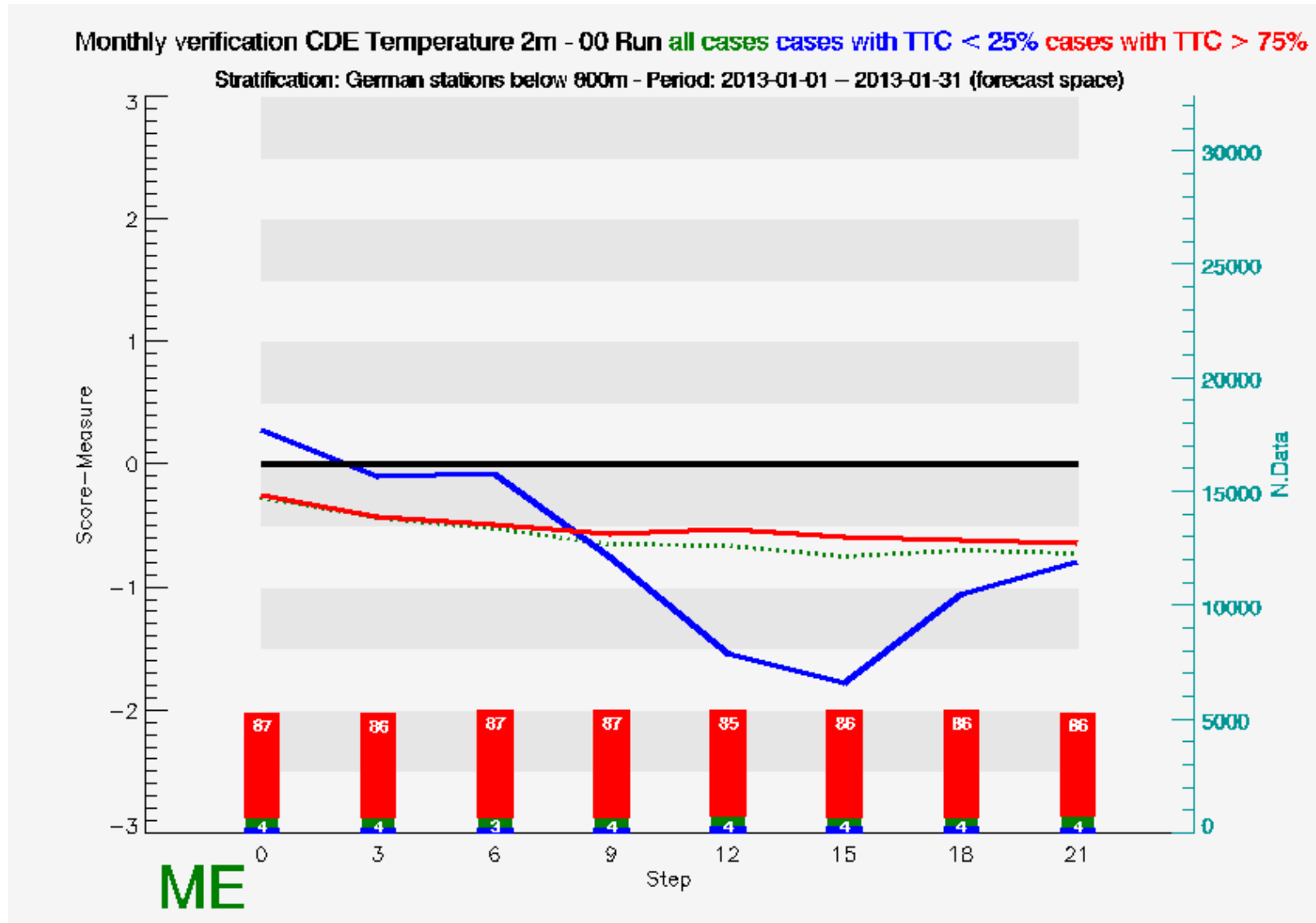
Stratification: German stations below 800m - Period: 2013-01-01 - 2013-01-31



Frequency distribution of low and high cloud covers January 2012, CDE (VERSUS conditional verification T2m)



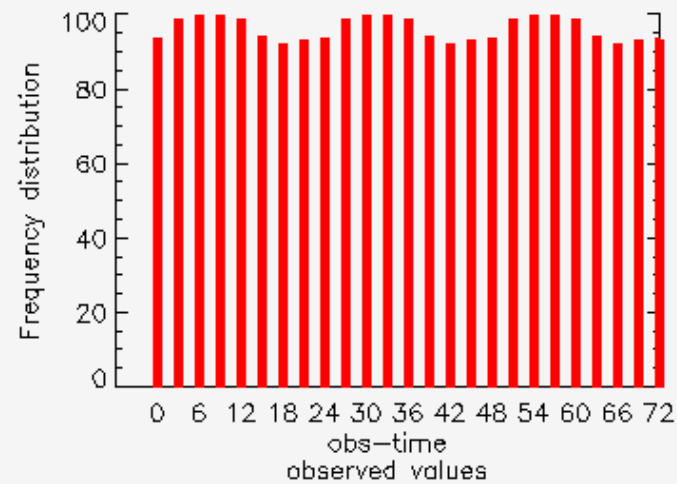
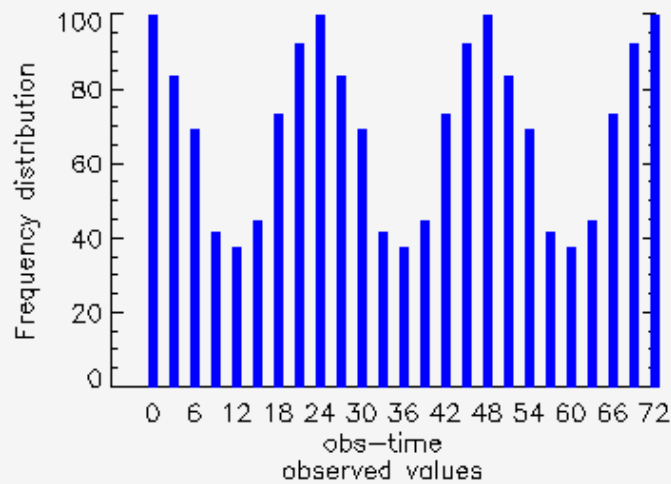
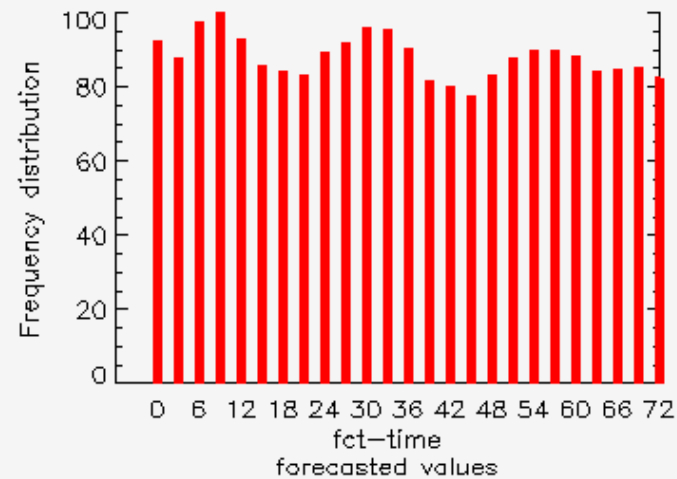
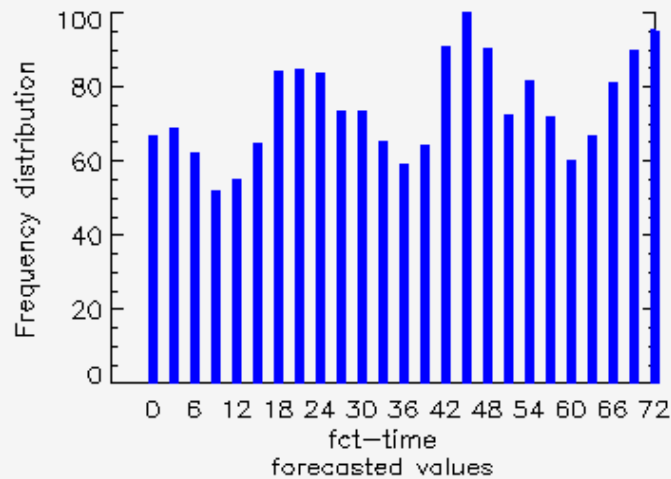
Frequency distribution of low and high cloud covers January 2013, CDE (VERSUS)



Frequency distribution of low and high cloud covers June 2012, CEU (VERSUS)

Monthly verification CEU Temperature 2m - 00 Run cases with TTC < 25% cases with TTC > 75%

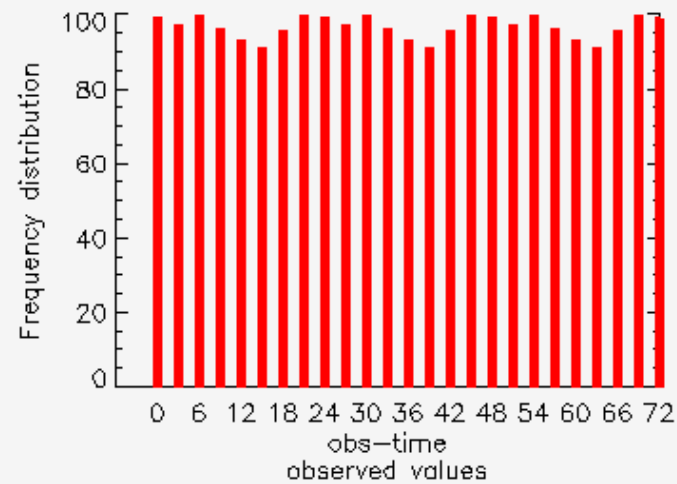
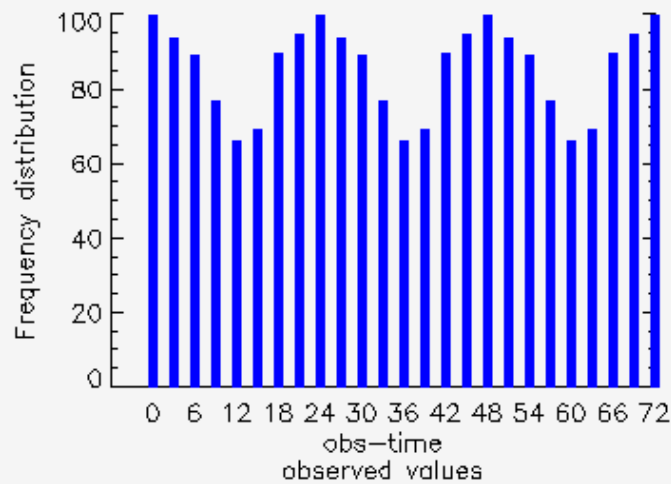
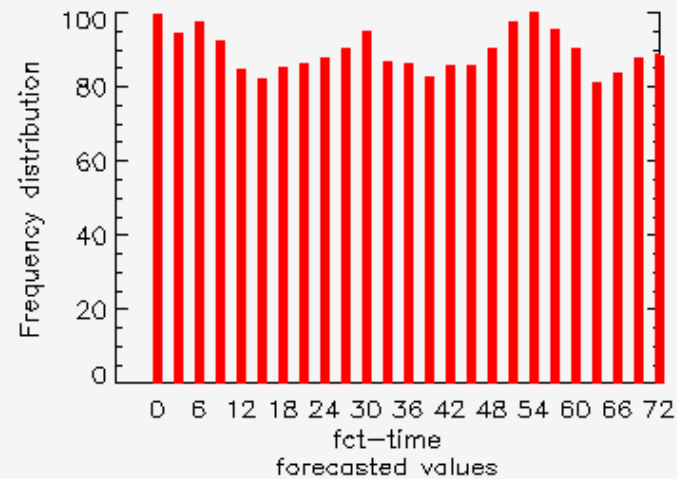
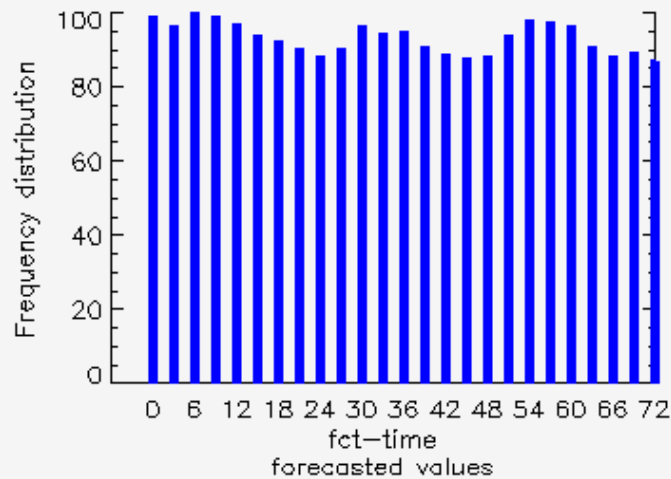
Stratification: German stations below 800m - Period: 2012-06-01 - 2012-06-30



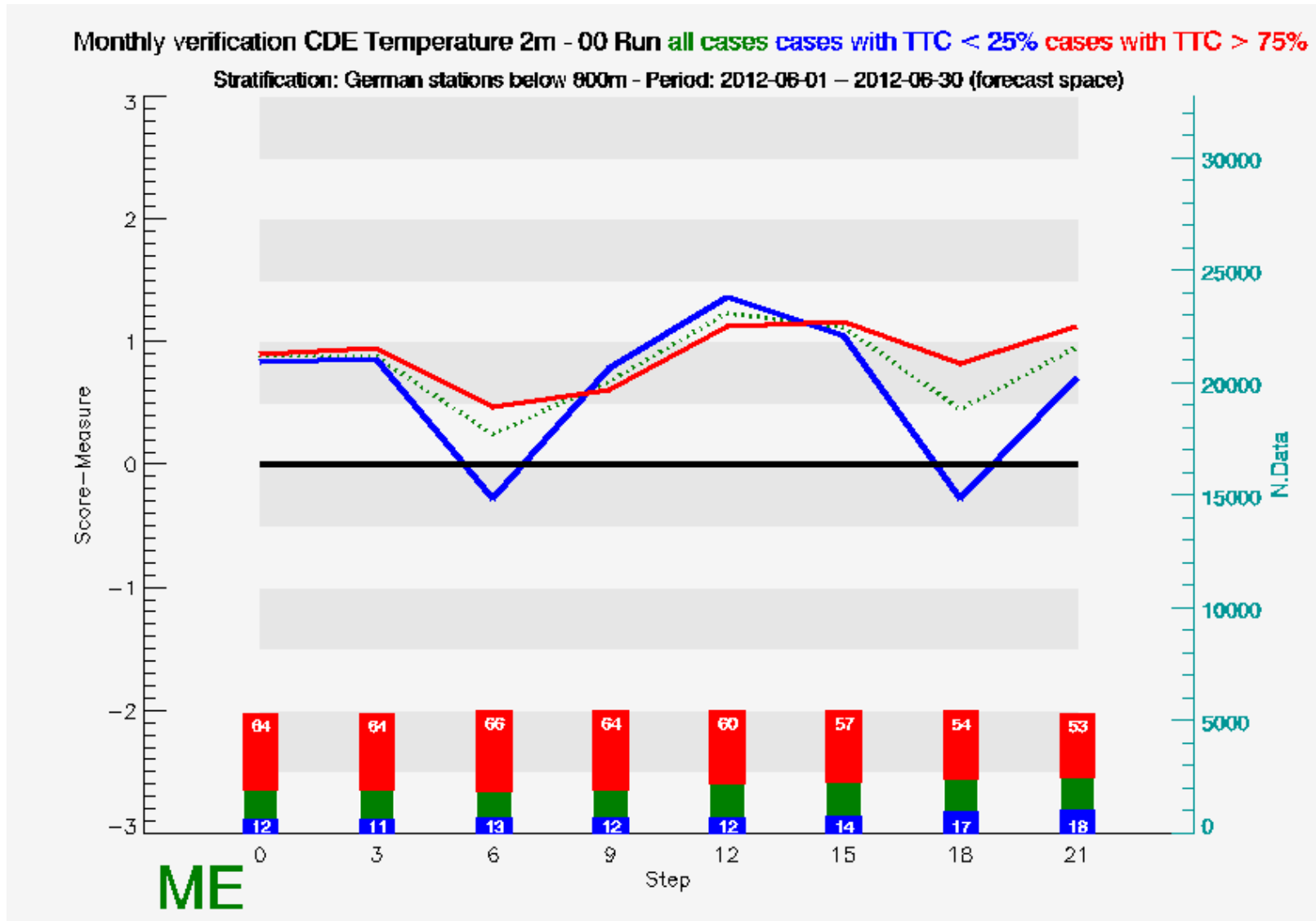
Frequency distribution of low and high cloud covers June 2013, CEU (VERSUS)

Monthly verification CEU Temperature 2m - 00 Run cases with TTC < 25% cases with TTC > 75%

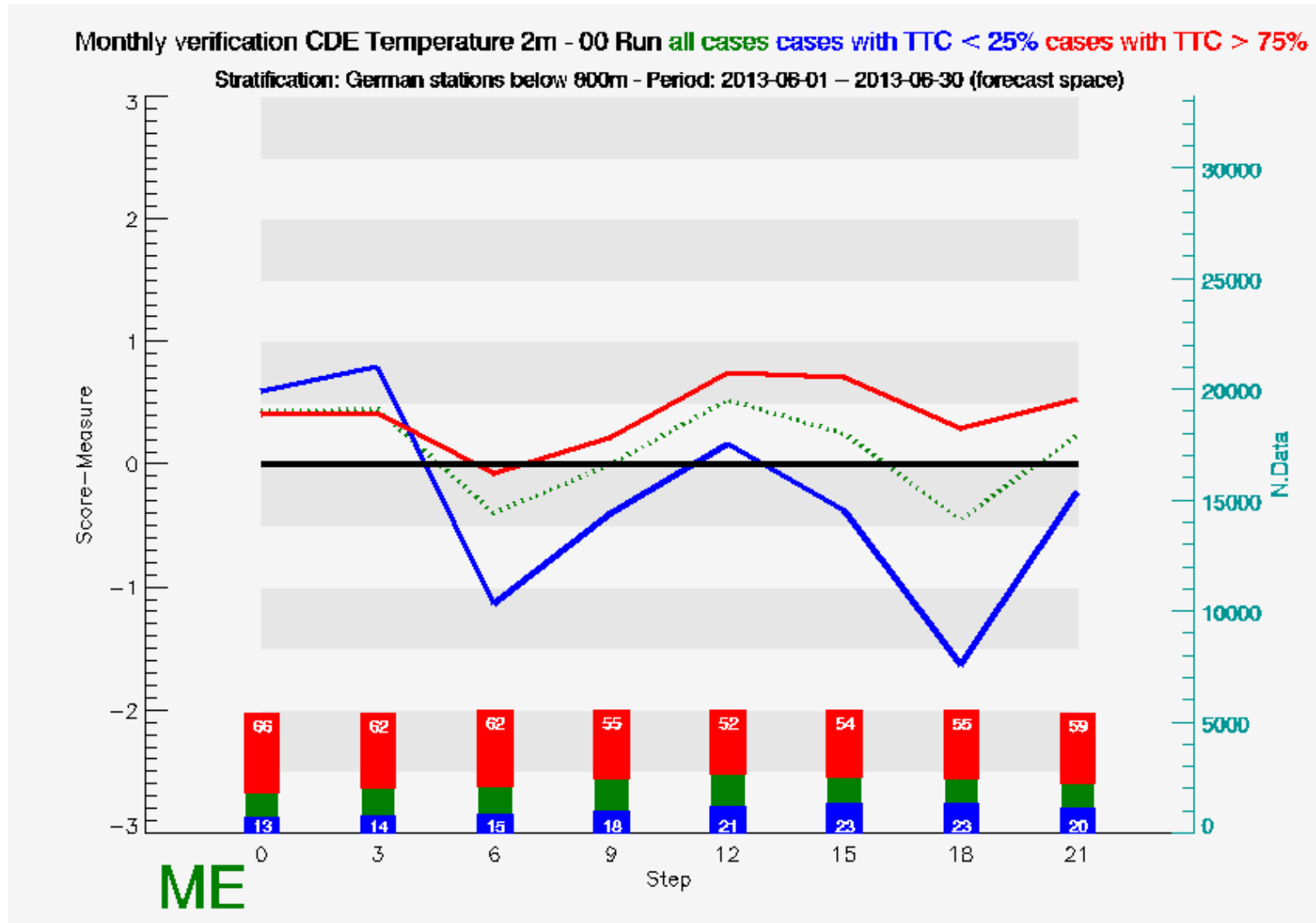
Stratification: German stations below 800m - Period: 2013-06-01 - 2013-06-30



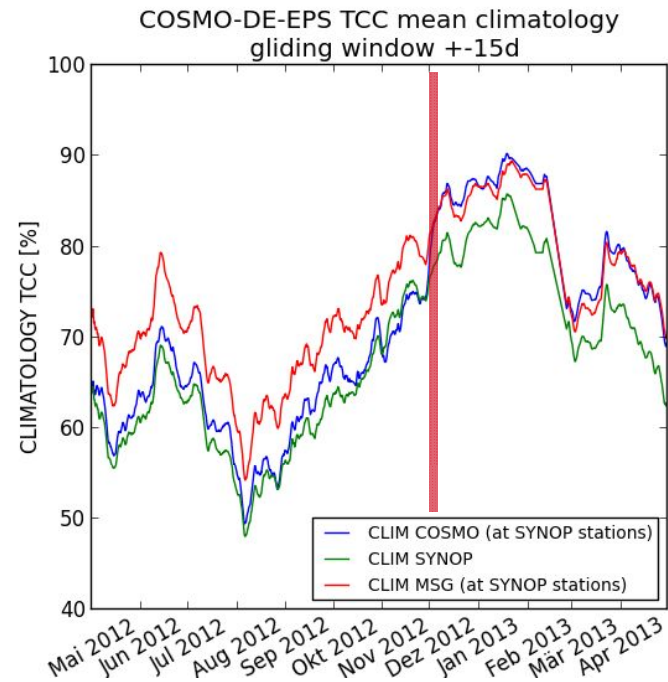
Frequency distribution of low and high cloud covers June 2012, CDE (VERSUS)



Frequency distribution of low and high cloud covers June 2013, CDE (VERSUS)

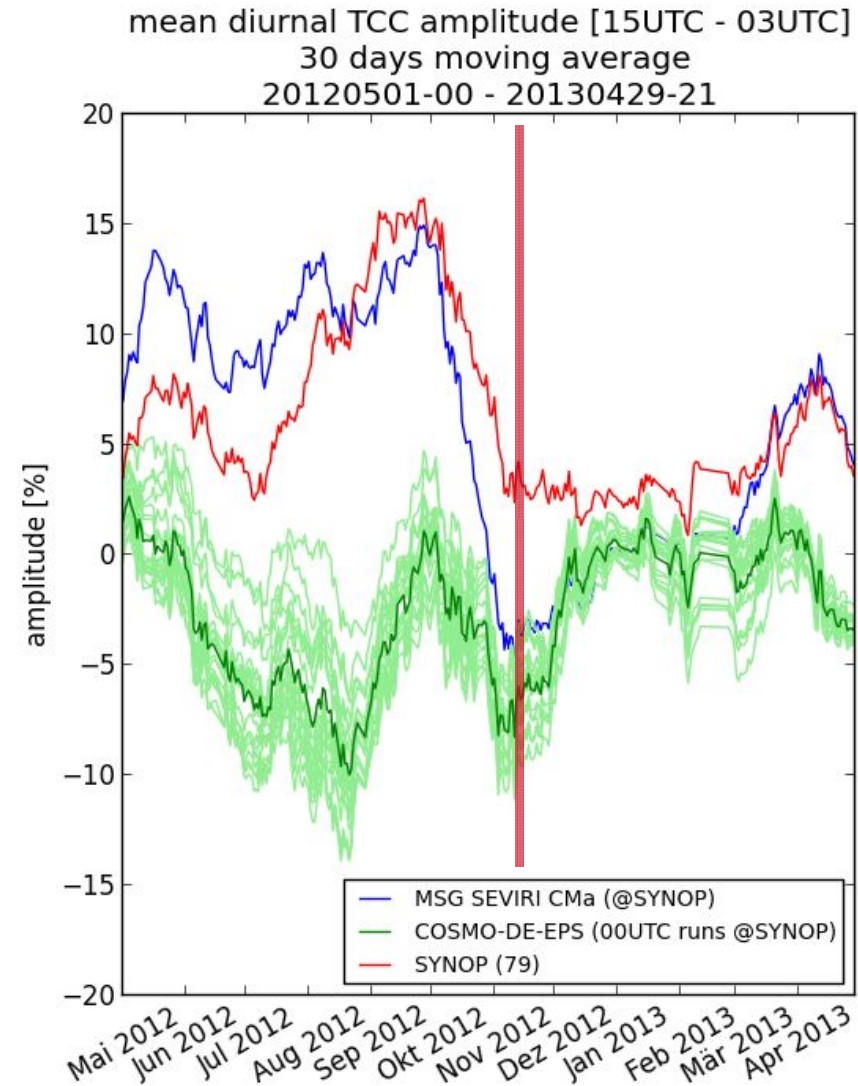


— Minimum diffusion coefficient



Before december SYNOP < COSMO < MSG
From december on SYNOP < COSMO ~ MSG

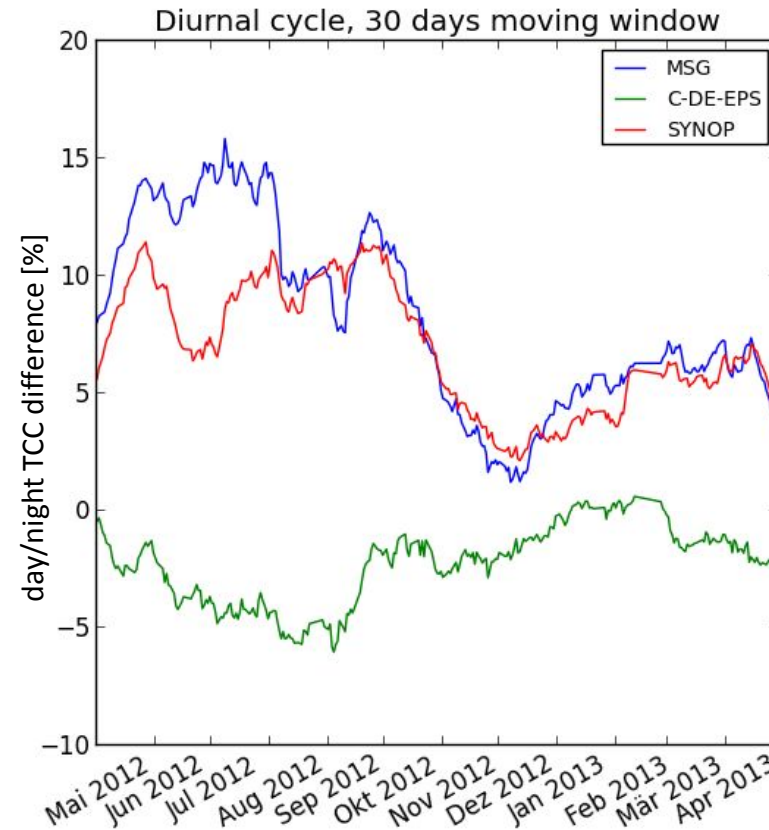
— Minimum diffusion coefficient



Before december SYNOP < COSMO < MSG
From december on SYNOP < COSMO ~ MSG



Day/Night Difference (seasonal) – Felix Fundel

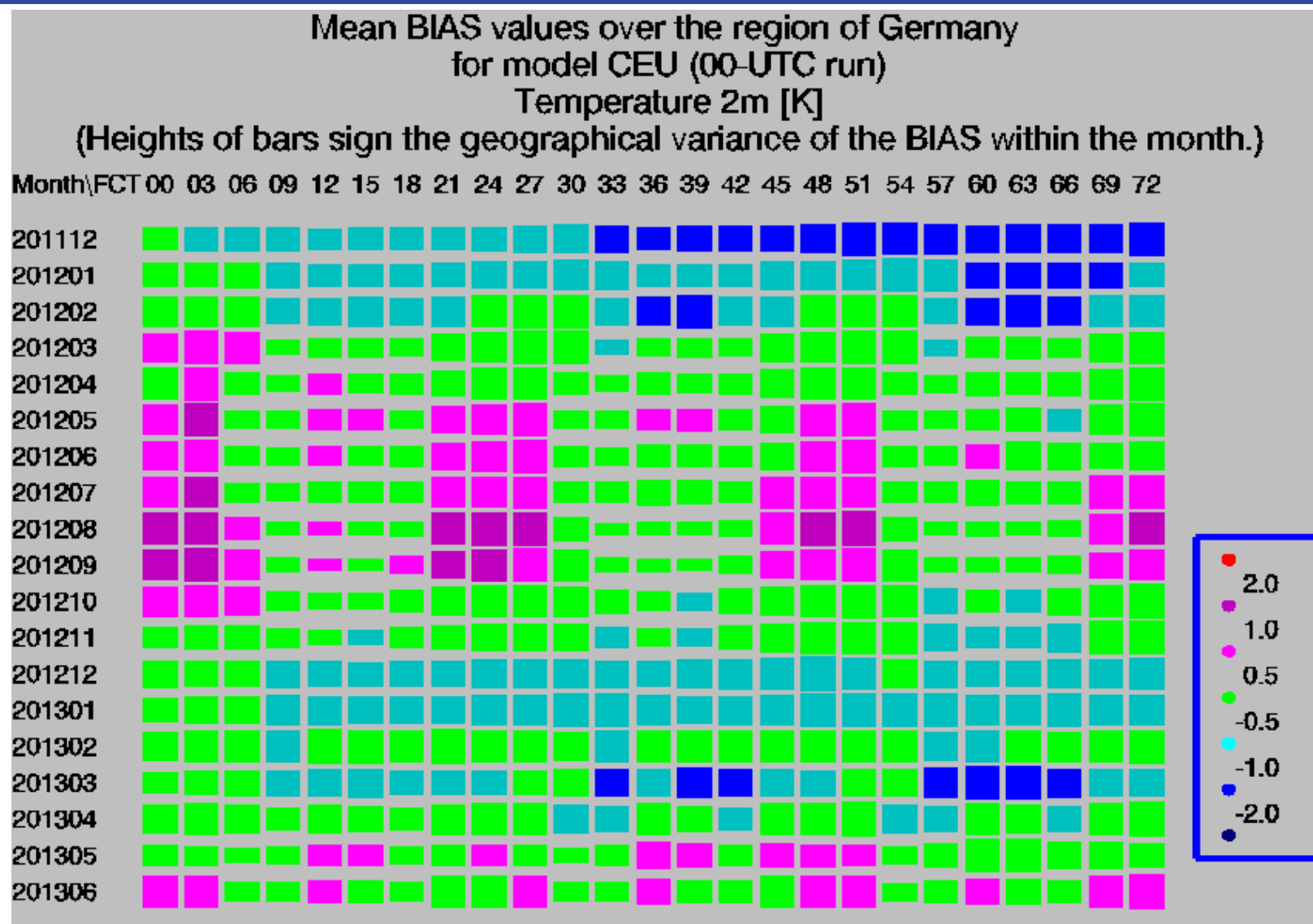


No (or even negative) diurnal cycle of COSMO-DE-EPS
Especially in summer & autumn

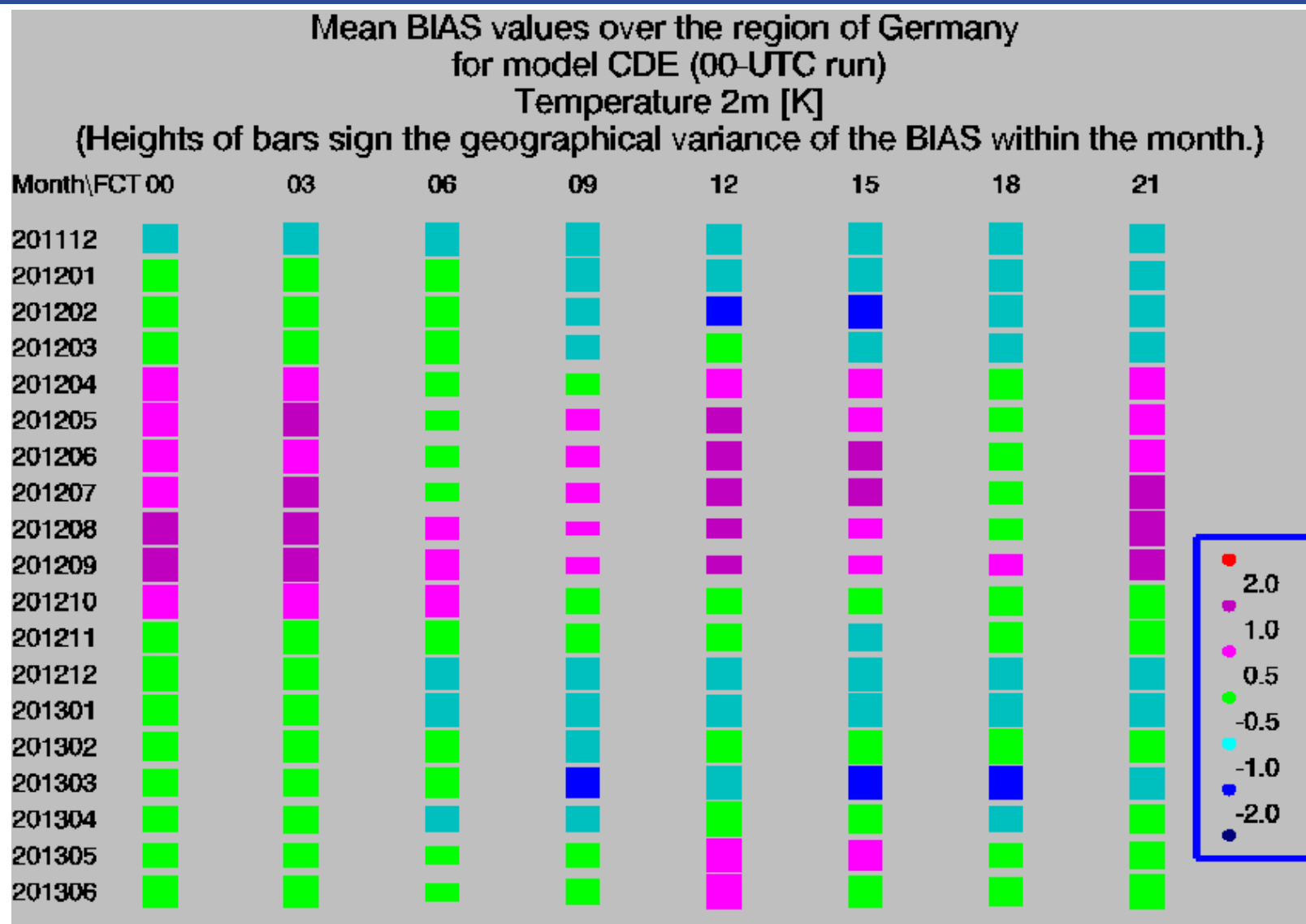
Good agreement between MSG and SYNOP



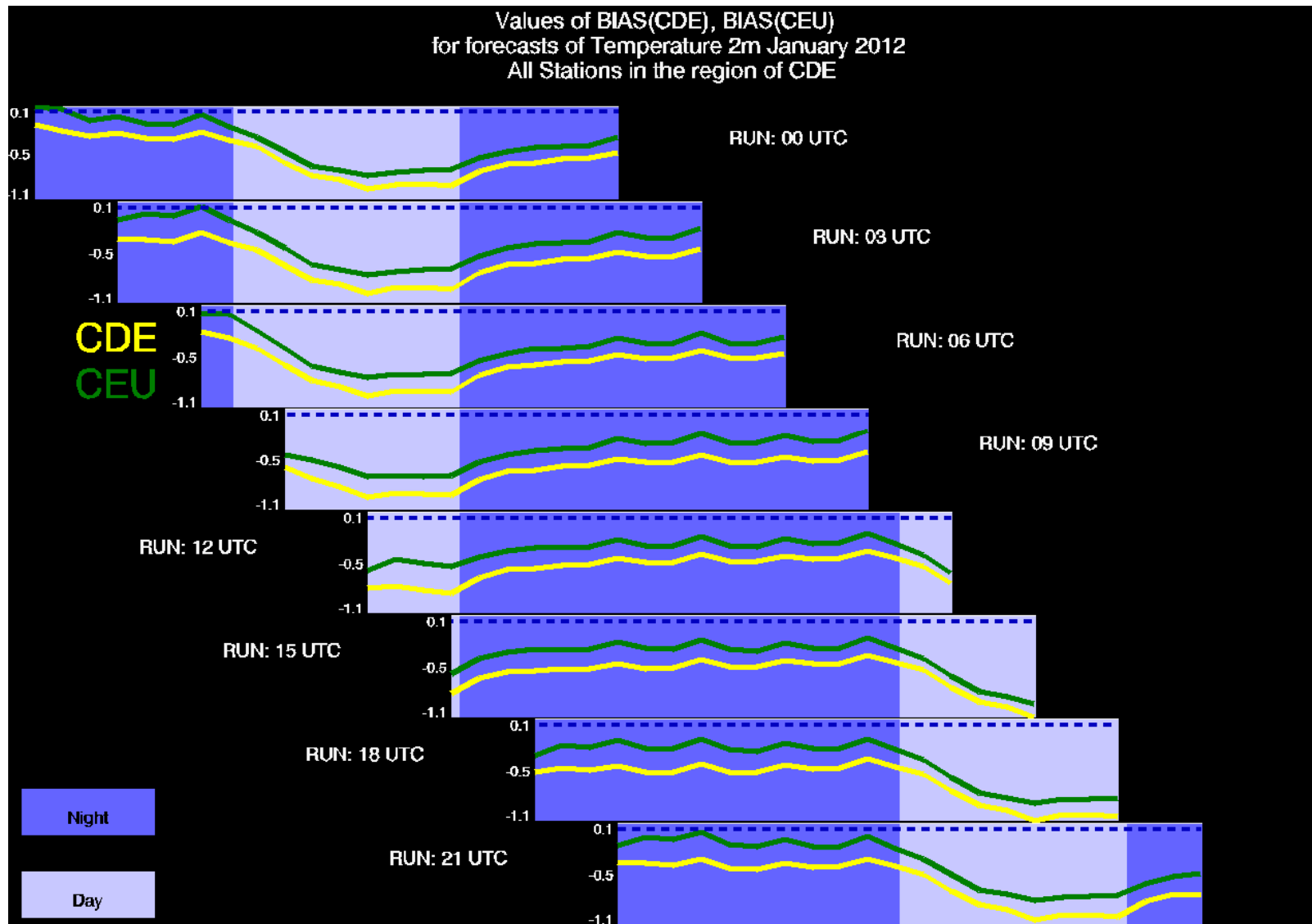
Bias of temperature 2m, CEU (VERSUS)



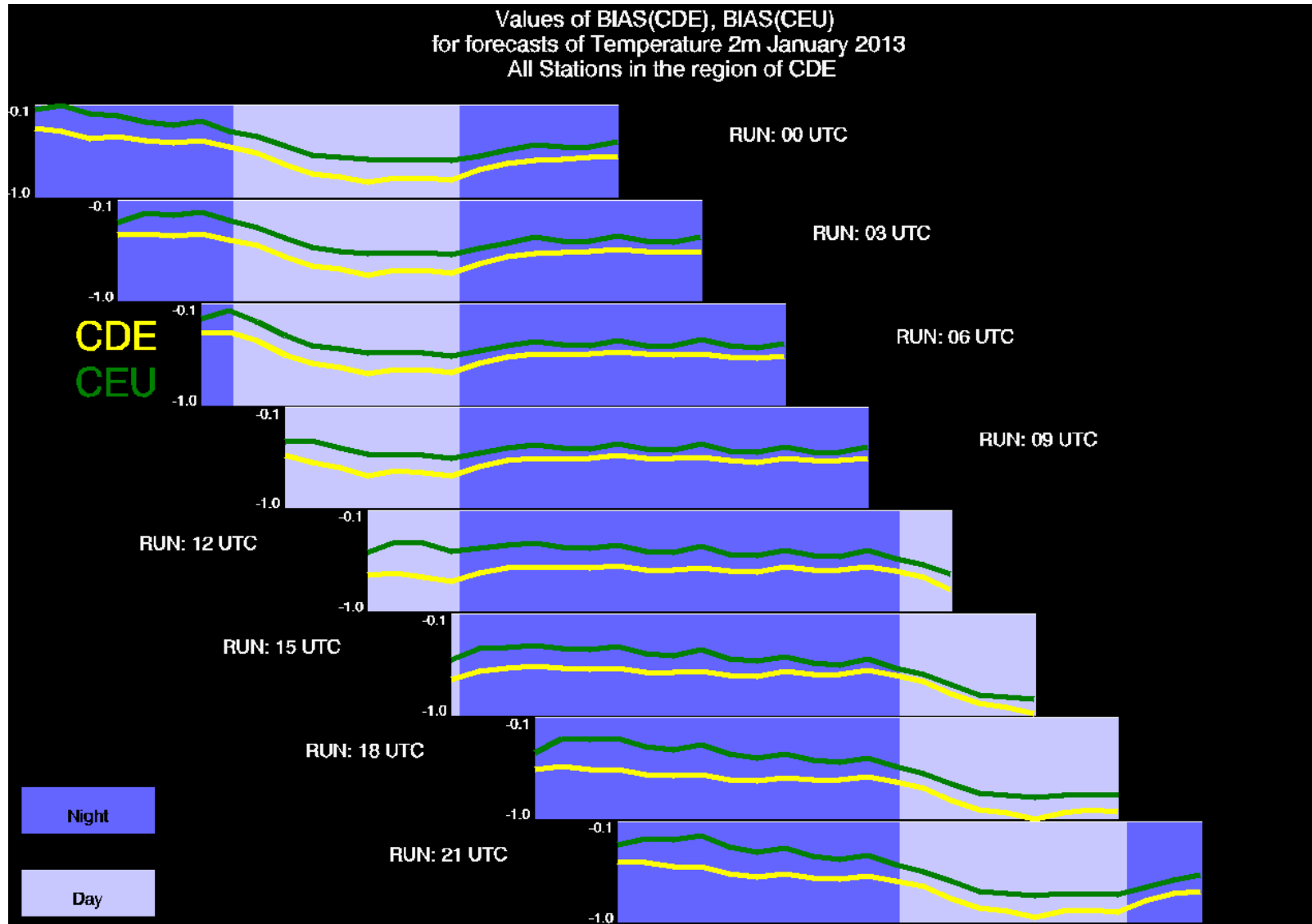
Bias of temperature 2m, CDE (VERSUS)



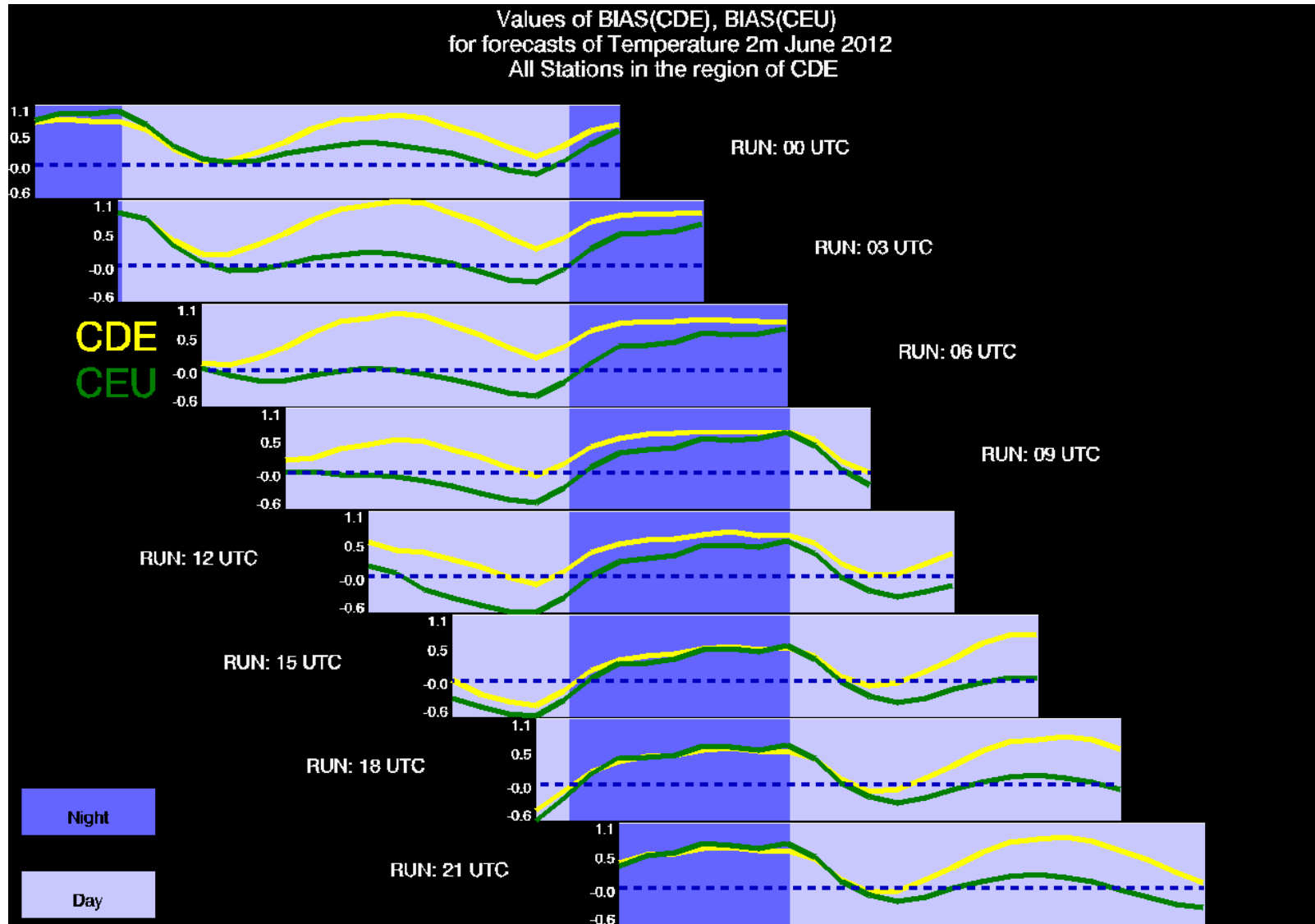
Bias of temperature 2m, January 2012 (standard verification at DWD)



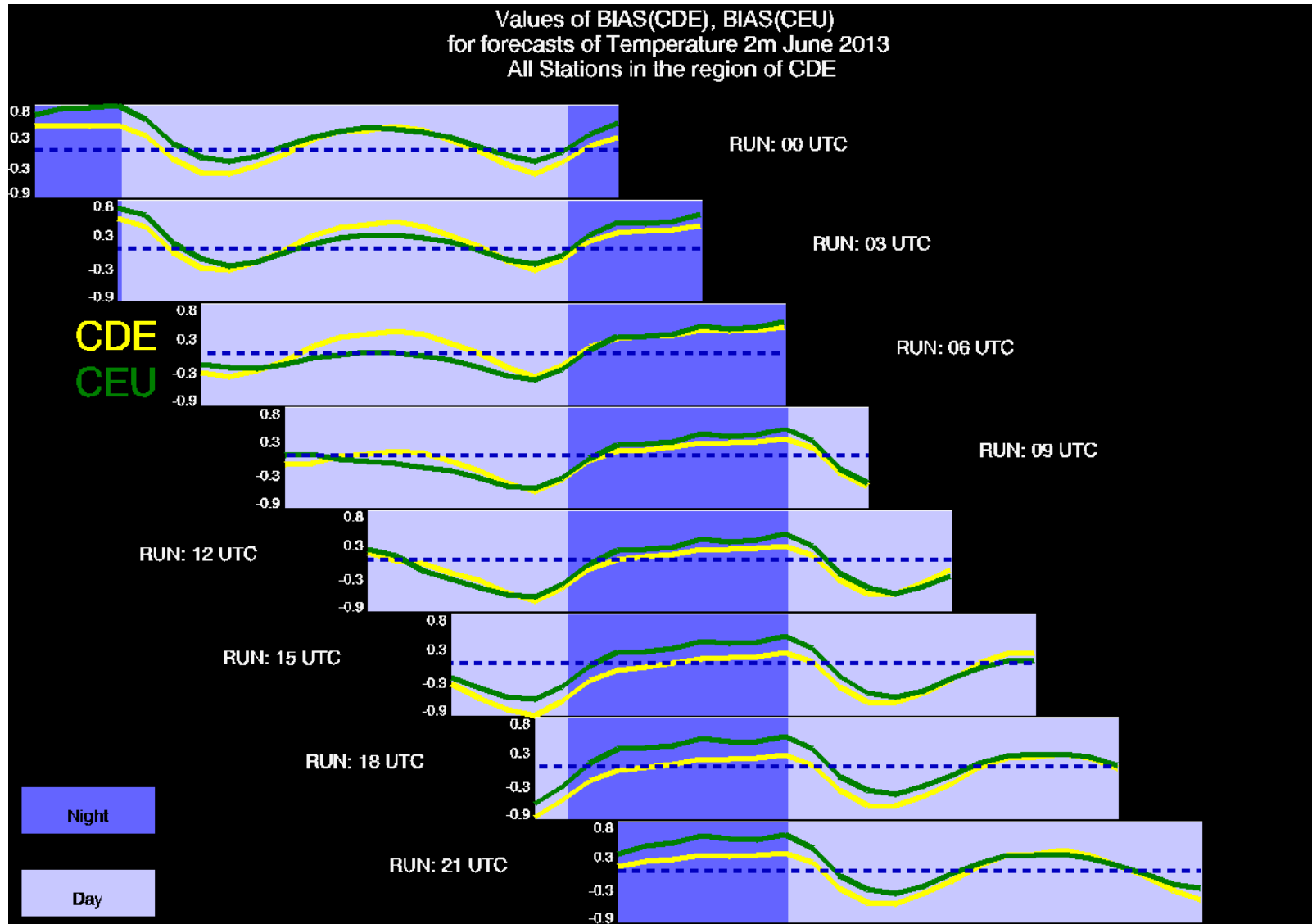
Bias of temperature 2m, January 2013 (standard verification at DWD)



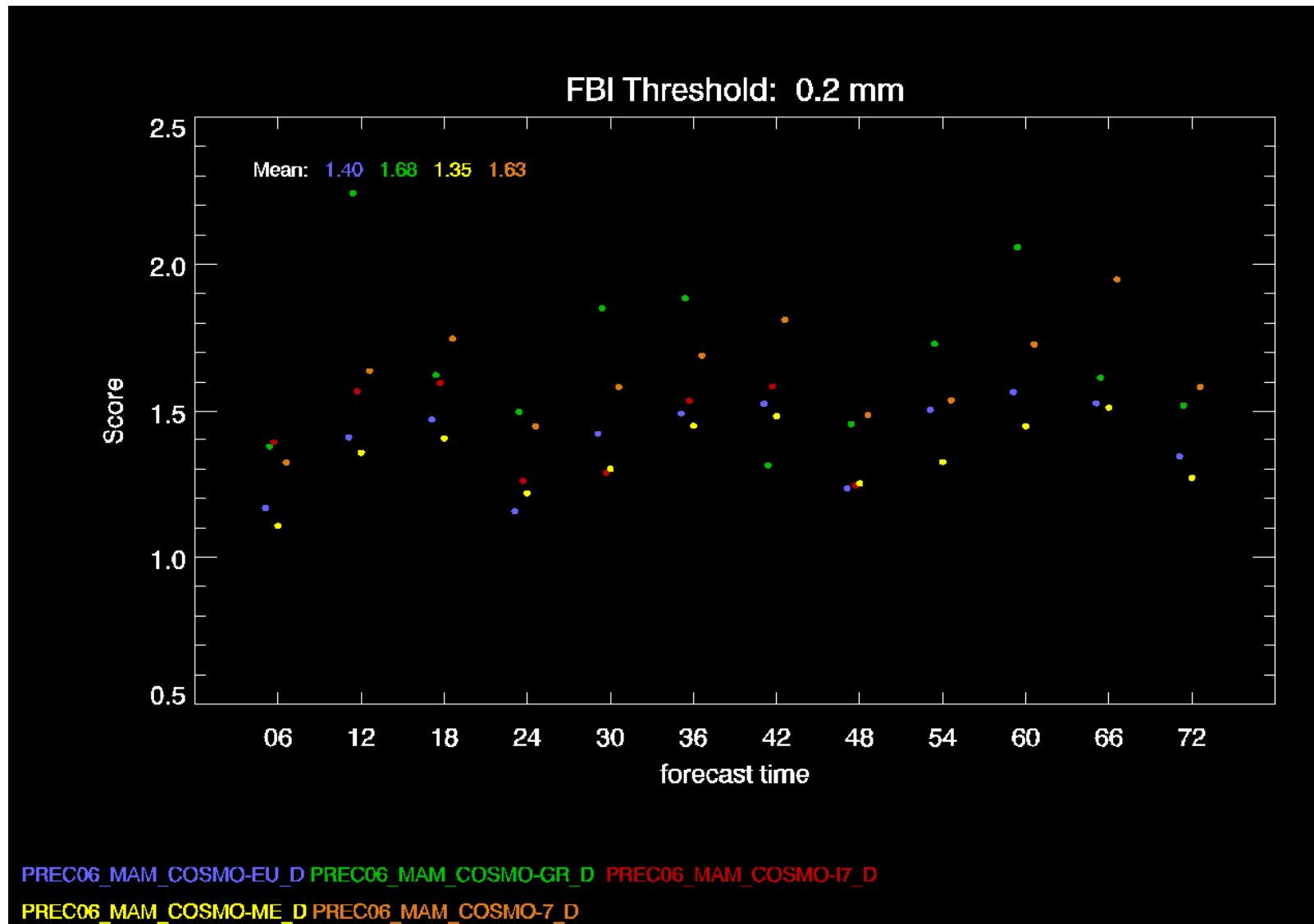
Bias of temperature 2m, June 2012 (standard verification at DWD)



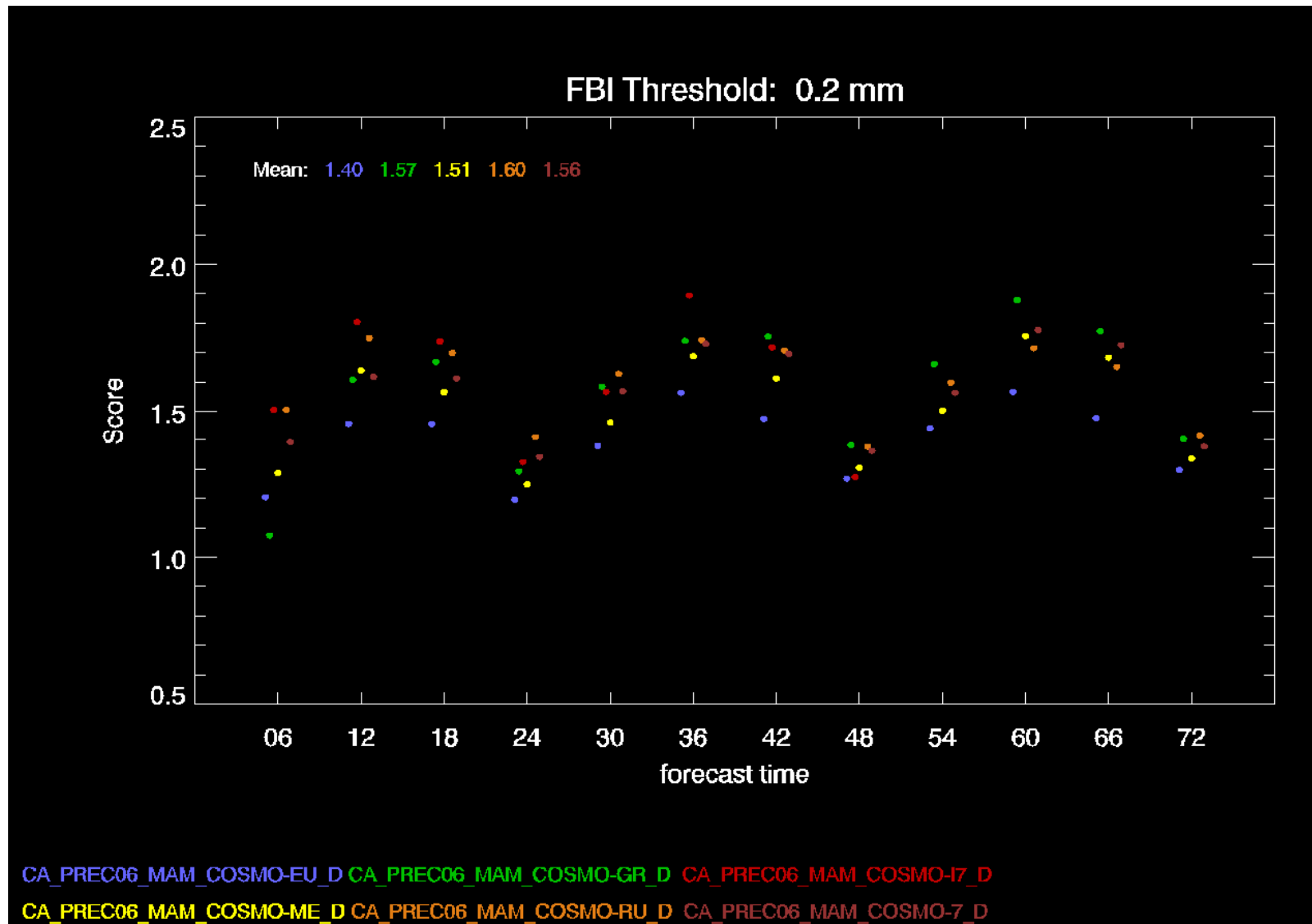
Bias of temperature 2m, June 2013 (standard verification at DWD)



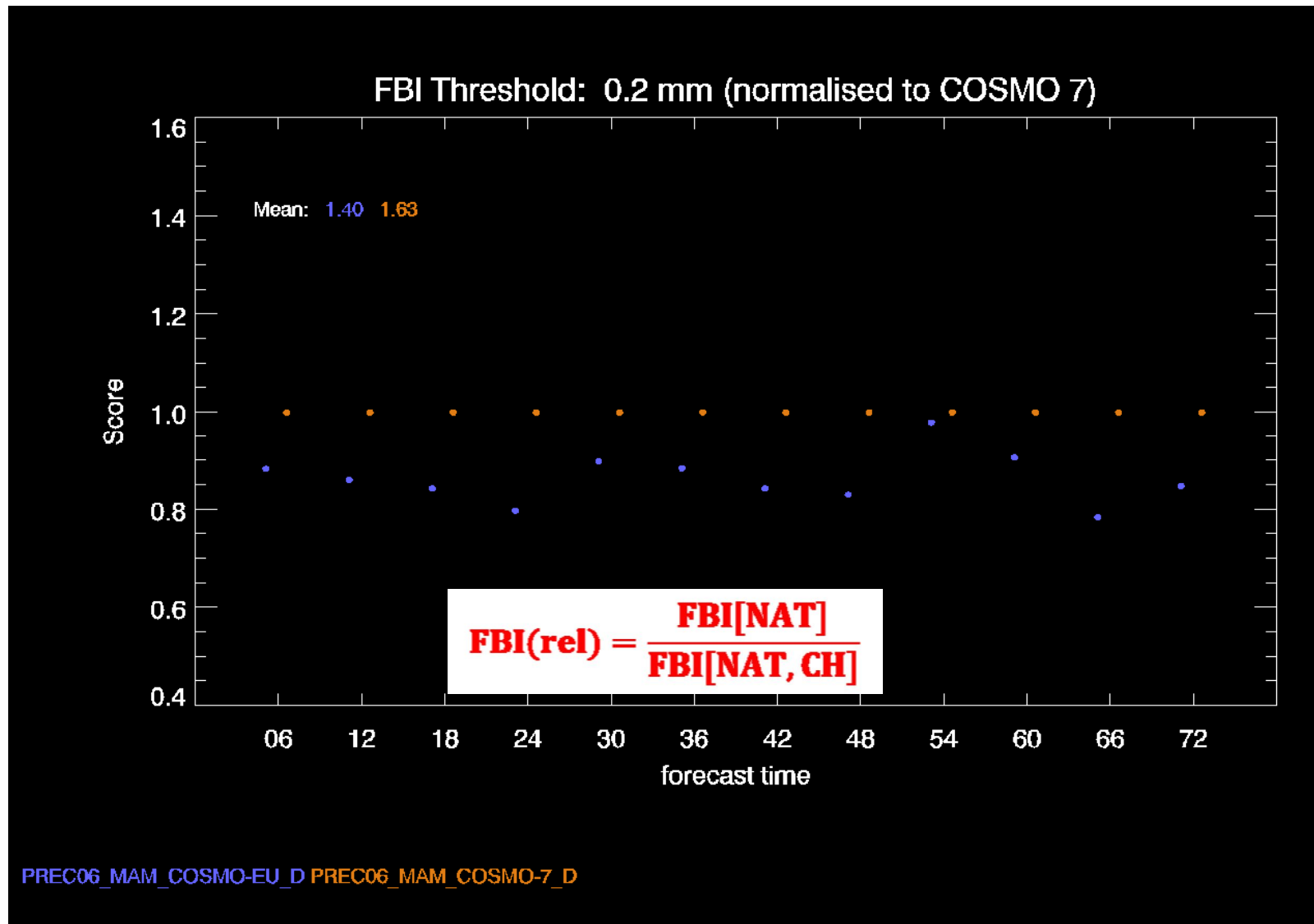
Common plots, MAM 2013, national chosen stations FBI for threshold 2mm (6h)⁻¹



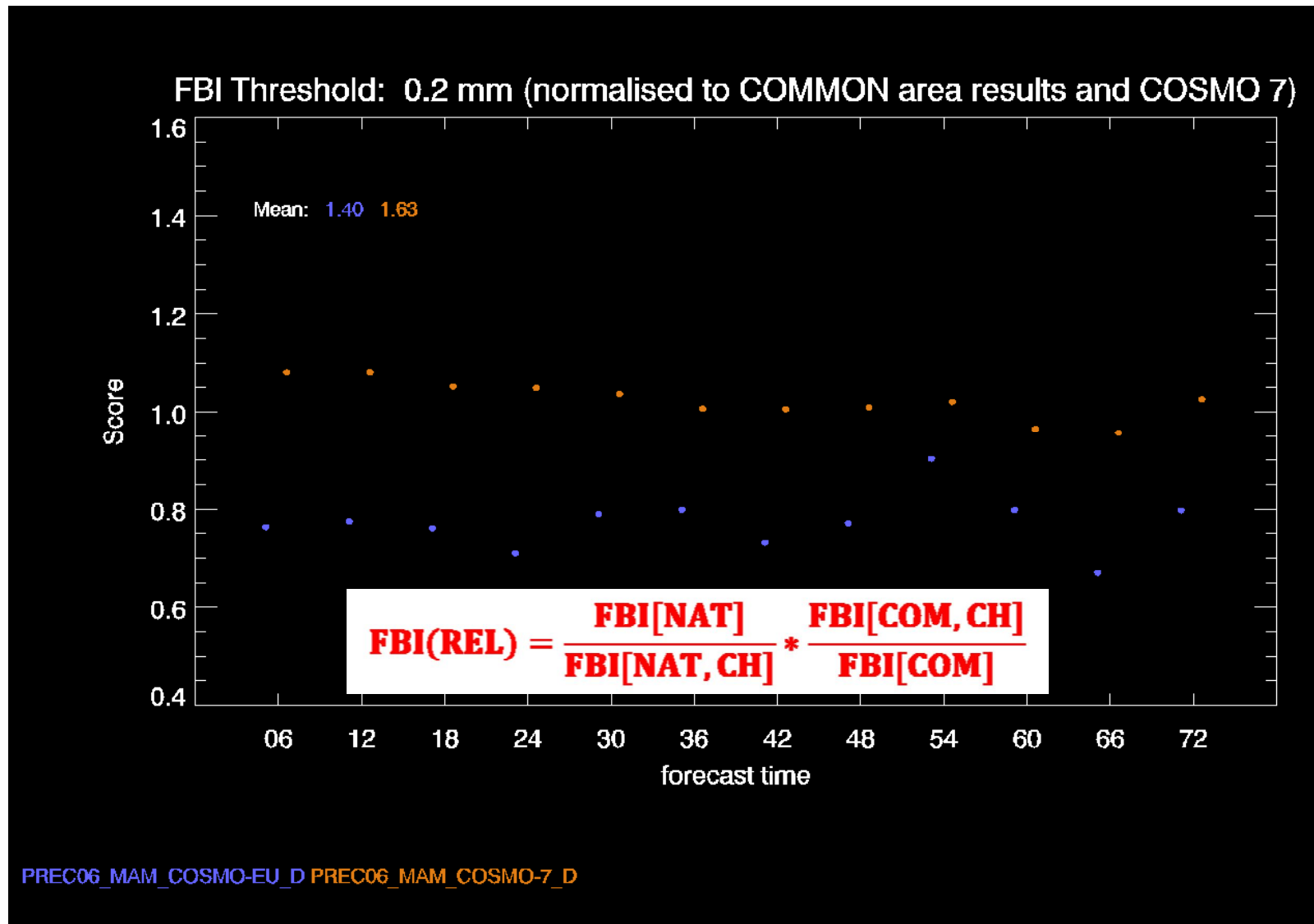
Common plots, MAM 2013, common stations FBI for threshold 2mm (6h)⁻¹



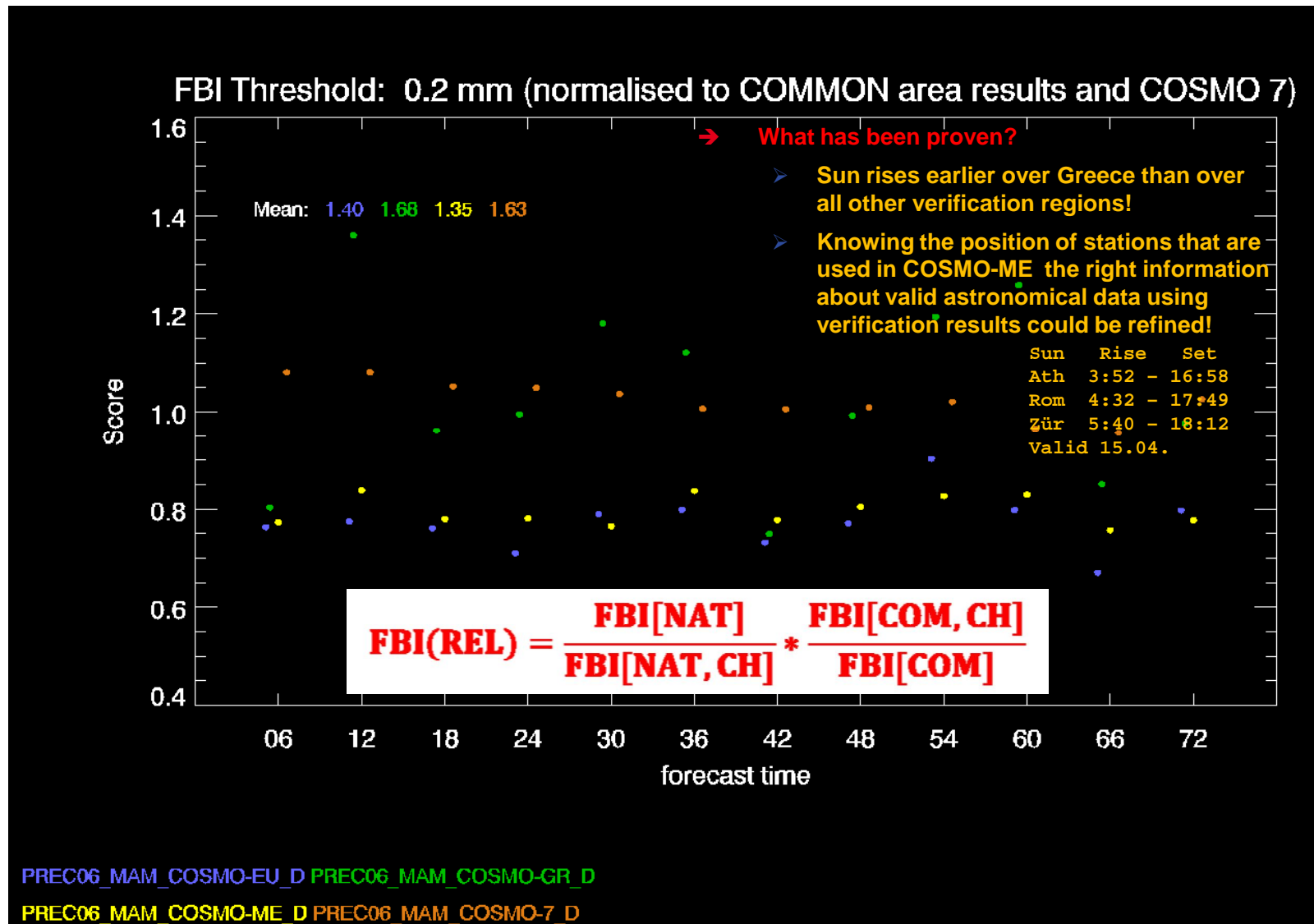
Common plots, MAM 2013, national chosen stations FBI for threshold 2mm (6h)⁻¹ relation CEU – C7



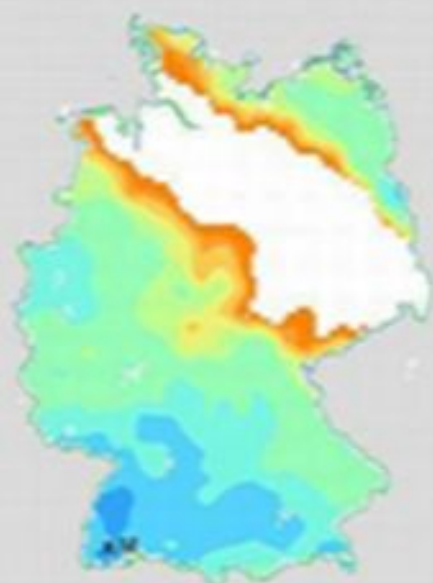
Common plots, MAM 2013, national chosen stations FBI for threshold 2mm (6h)⁻¹ relation CEU – C7, normalised to common stations



Common plots, MAM 2013, national chosen stations FBI for threshold 2mm (6h)⁻¹ relation CEU – C7, normalised to common stations



HM1

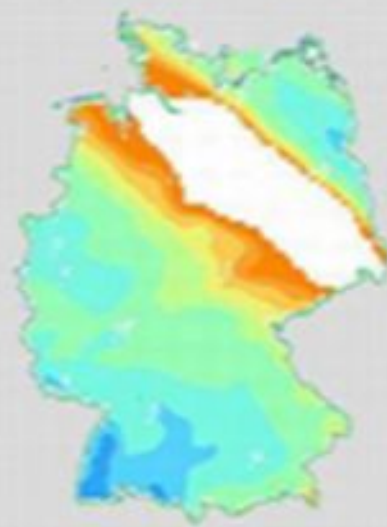


> 75.0
60-75.0
50-60.0
40-50.0
30-40.0
20-30.0
10-20.0
0.0-10.0
0.0-0.0
0.0-0.0
= 0.0

Niederschlag von 08.03.1999 06 UTC bis 08.03.1999 06 UTC (kg m²)
(Analyse)

Minimum: 0.0 Maximum: 28.35 Mittelwert: 5.128

DM4



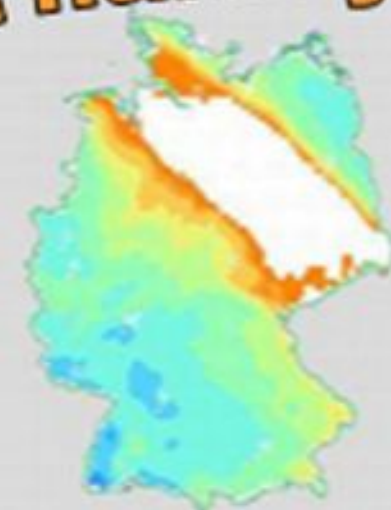
> 75.0
60-75.0
50-60.0
40-50.0
30-40.0
20-30.0
10-20.0
0.0-10.0
0.0-0.0
0.0-0.0
= 0.0

Gesamtniederschlag (kg m²)
Vorhersage von 08.03.1999 00 UTC (Differenz: T+30 - T+06 h)

Minimum: 0.0 Maximum: 38.28 Mittelwert: 4.438

Thank you for your attention!

LM1



> 75.0
60-75.0
50-60.0
40-50.0
30-40.0
20-30.0
10-20.0
0.0-10.0
0.0-0.0
0.0-0.0
= 0.0

Gesamtniederschlag (kg m²)
Vorhersage von 08.03.1999 00 UTC (Differenz: T+30 - T+06 h)

Minimum: 0.0 Maximum: 36.92 Mittelwert: 3.851

GME



> 75.0
60-75.0
50-60.0
40-50.0
30-40.0
20-30.0
10-20.0
0.0-10.0
0.0-0.0
0.0-0.0
= 0.0

Gesamtniederschlag (kg m²)
Vorhersage von 08.03.1999 00 UTC (Differenz: T+30 - T+06 h)

Minimum: 0.0 Maximum: 15.94 Mittelwert: 4.485