

On the problem of diurnal cycle of quality of mean surface level pressure

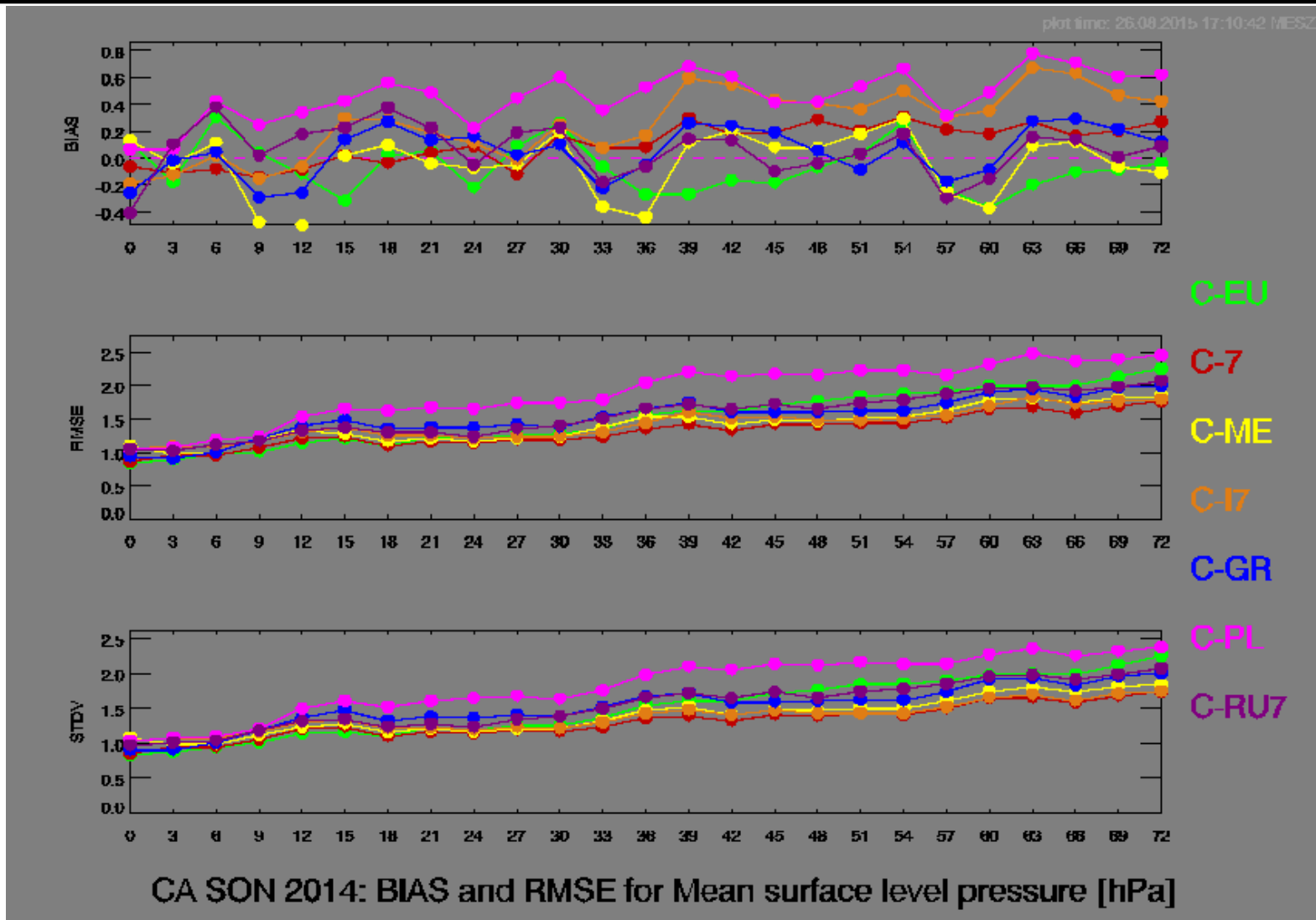
Ulrich Damrath

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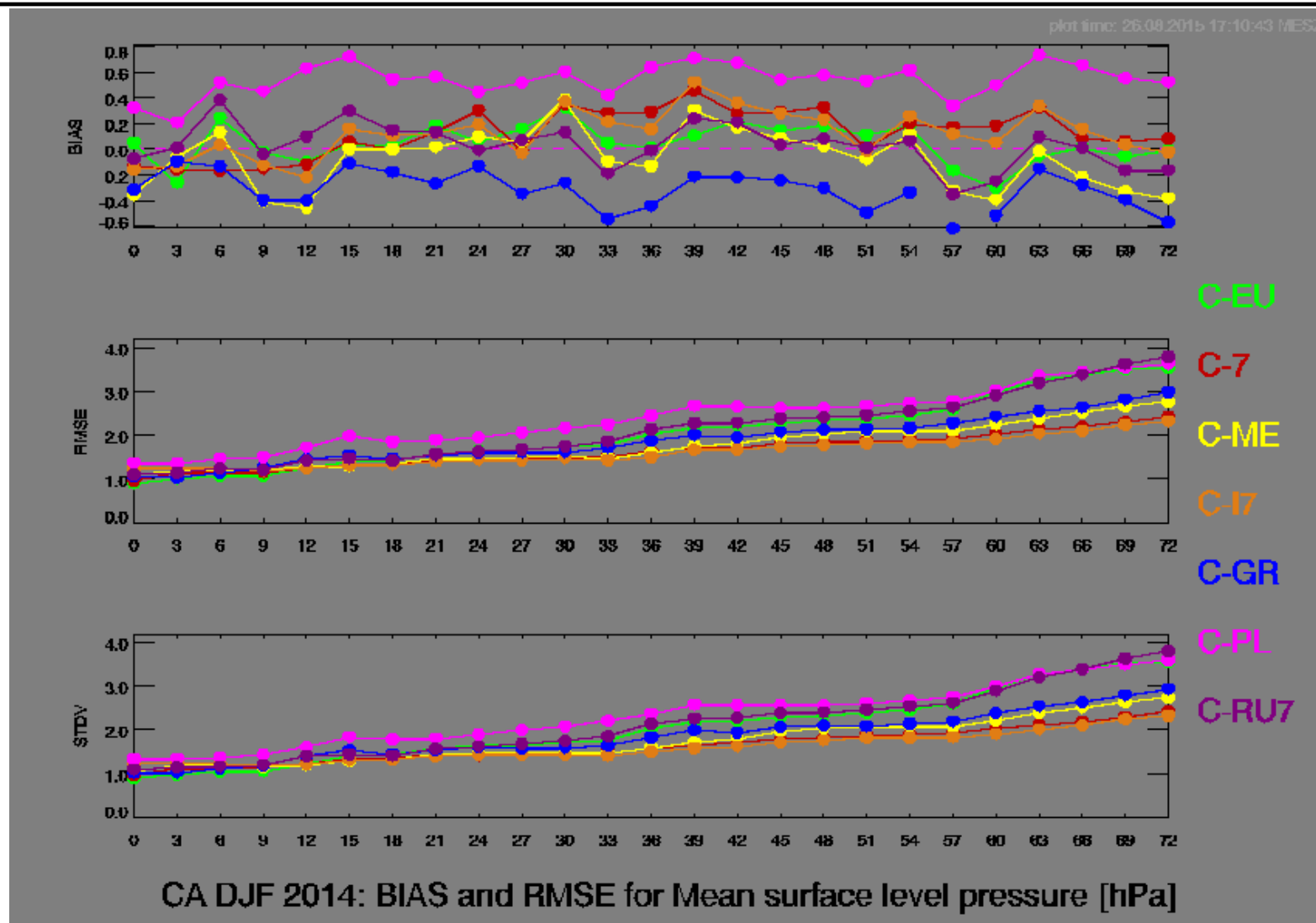


- **RMSE for pressure at mean surface level has the following properties:**
 - *More or less monotonically error growth during Winter, Spring and Autumn*
 - *Distinguished peaks at forecast times for the afternoon during summer*
 - *Remarkable differences for forecast quality especially for day three depending on the type of the driving model*

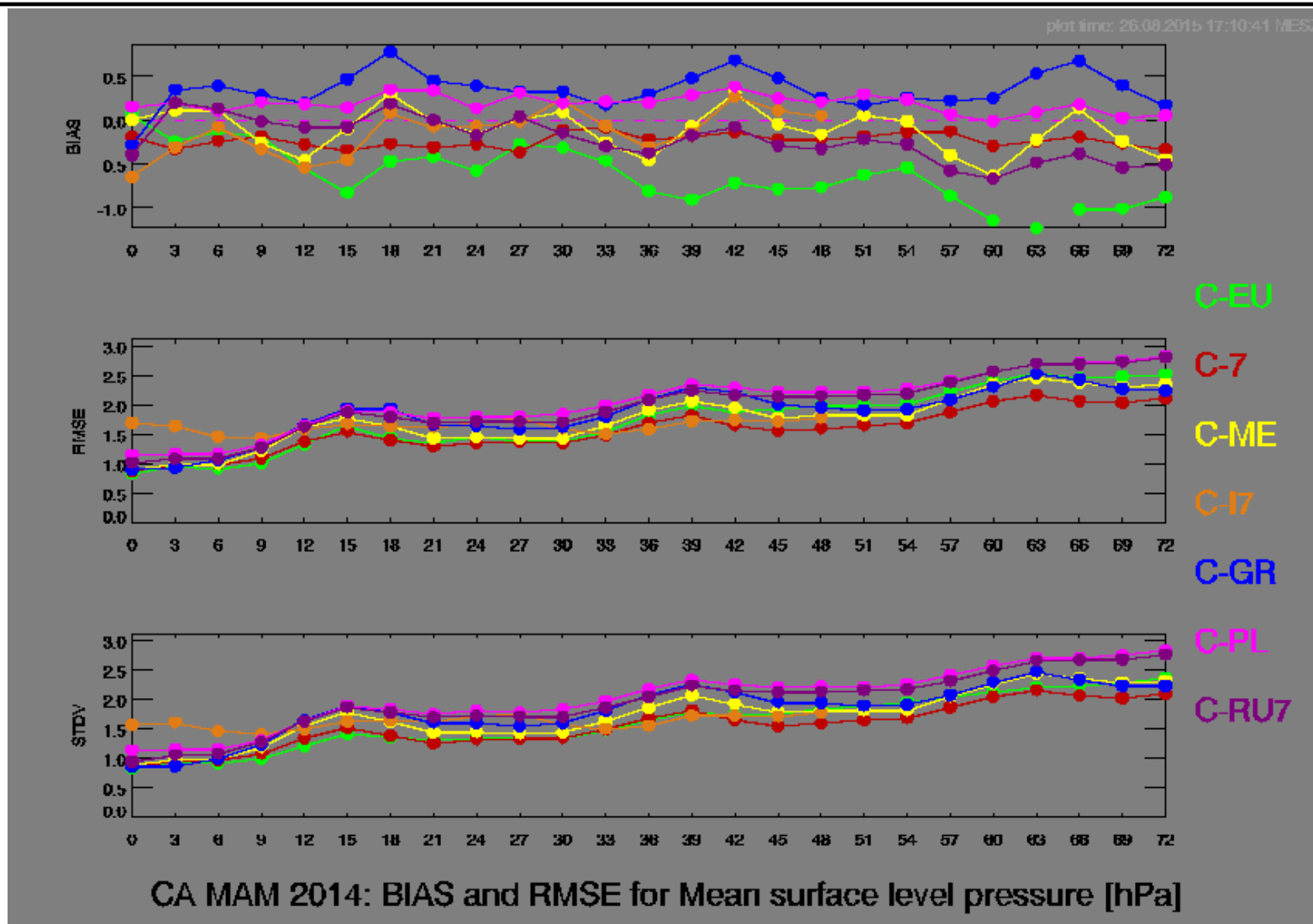
MSLP errors SON 2014 common area



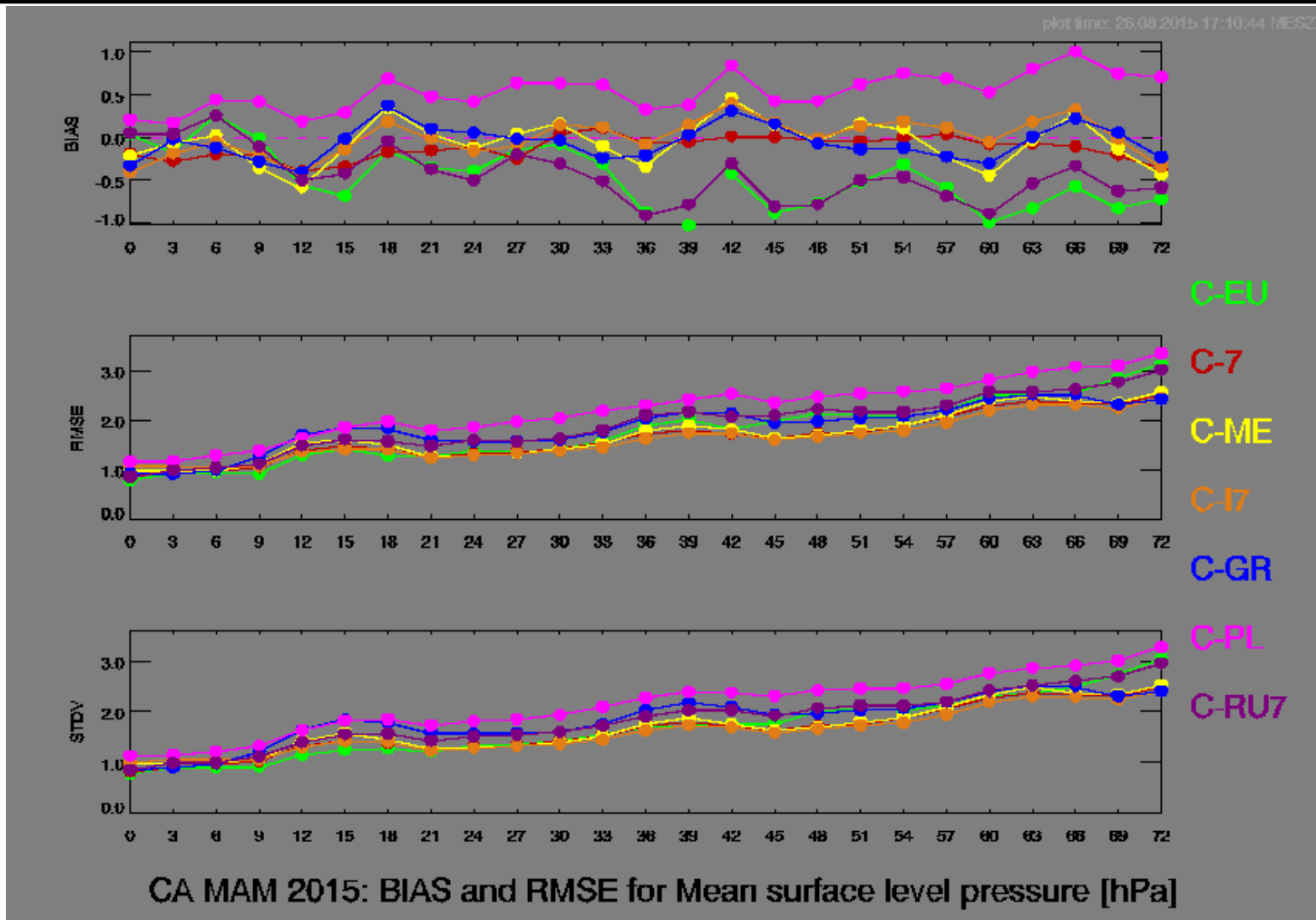
MSLP errors DJF 2014/15 common area



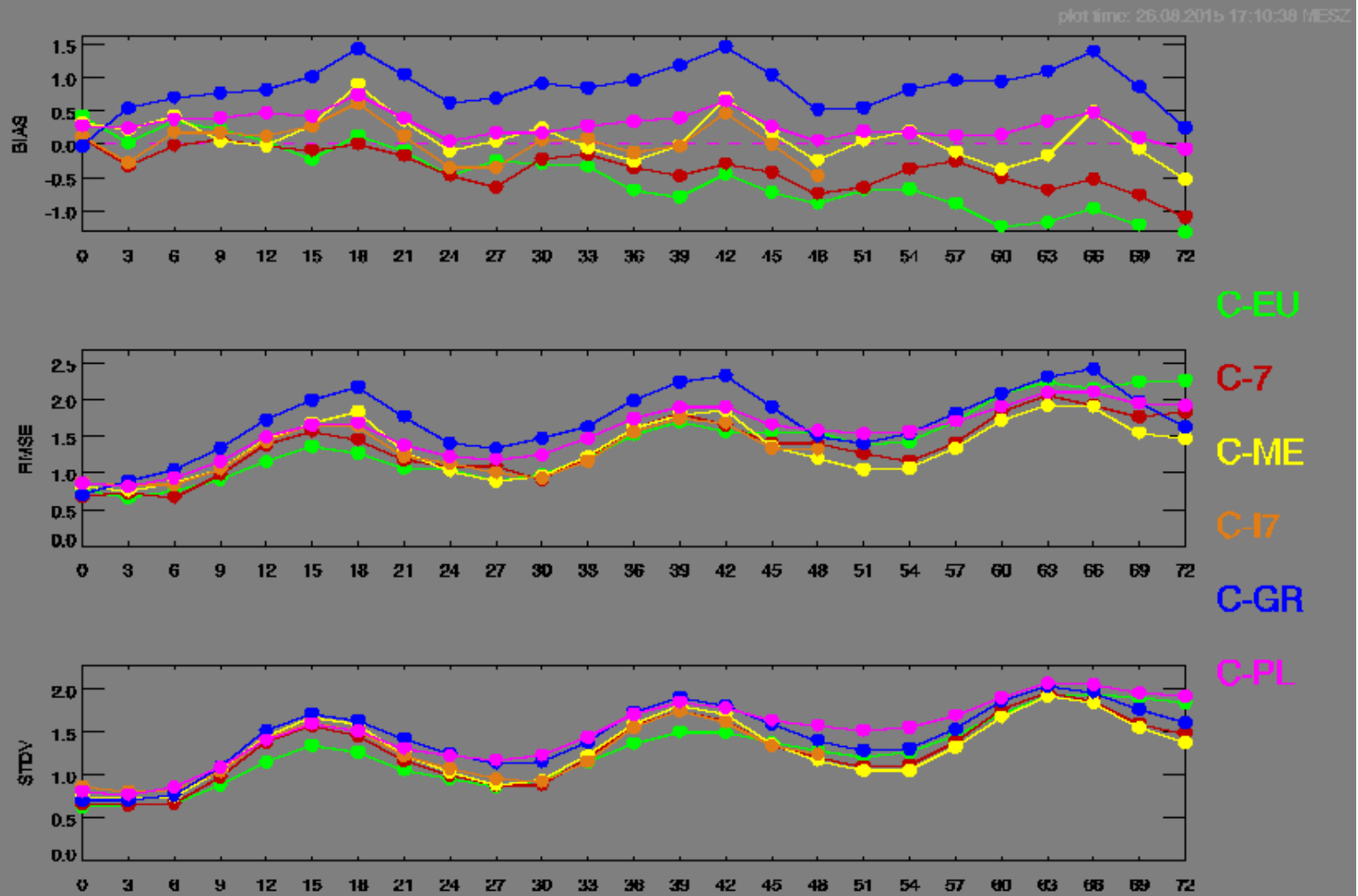
MSLP errors MAM 2014 common area



MSLP errors MAM 2015 common area



MSLP errors JJA 2013 common area

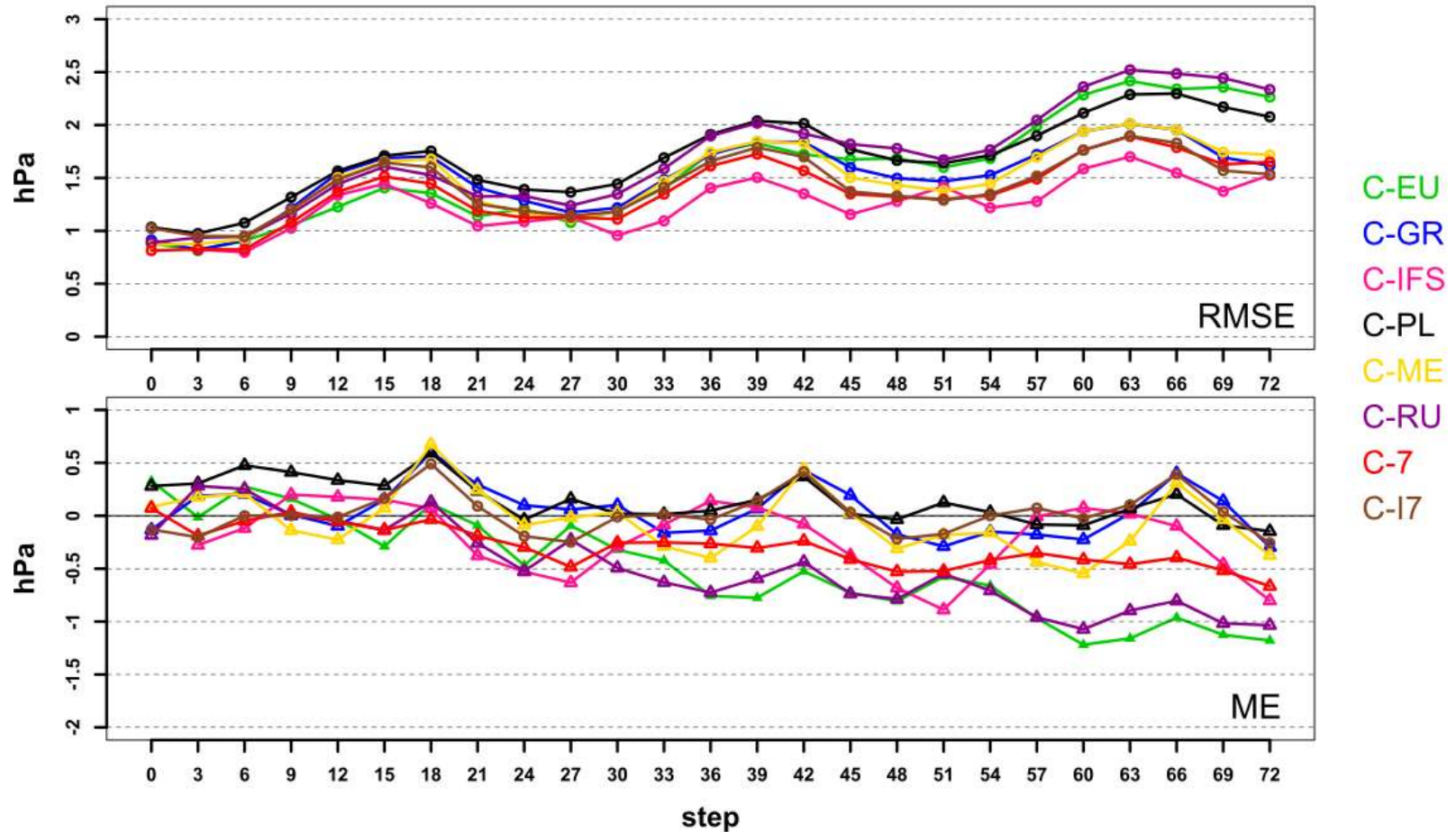


CA JJA 2013: BIAS and RMSE for Mean surface level pressure [hPa]

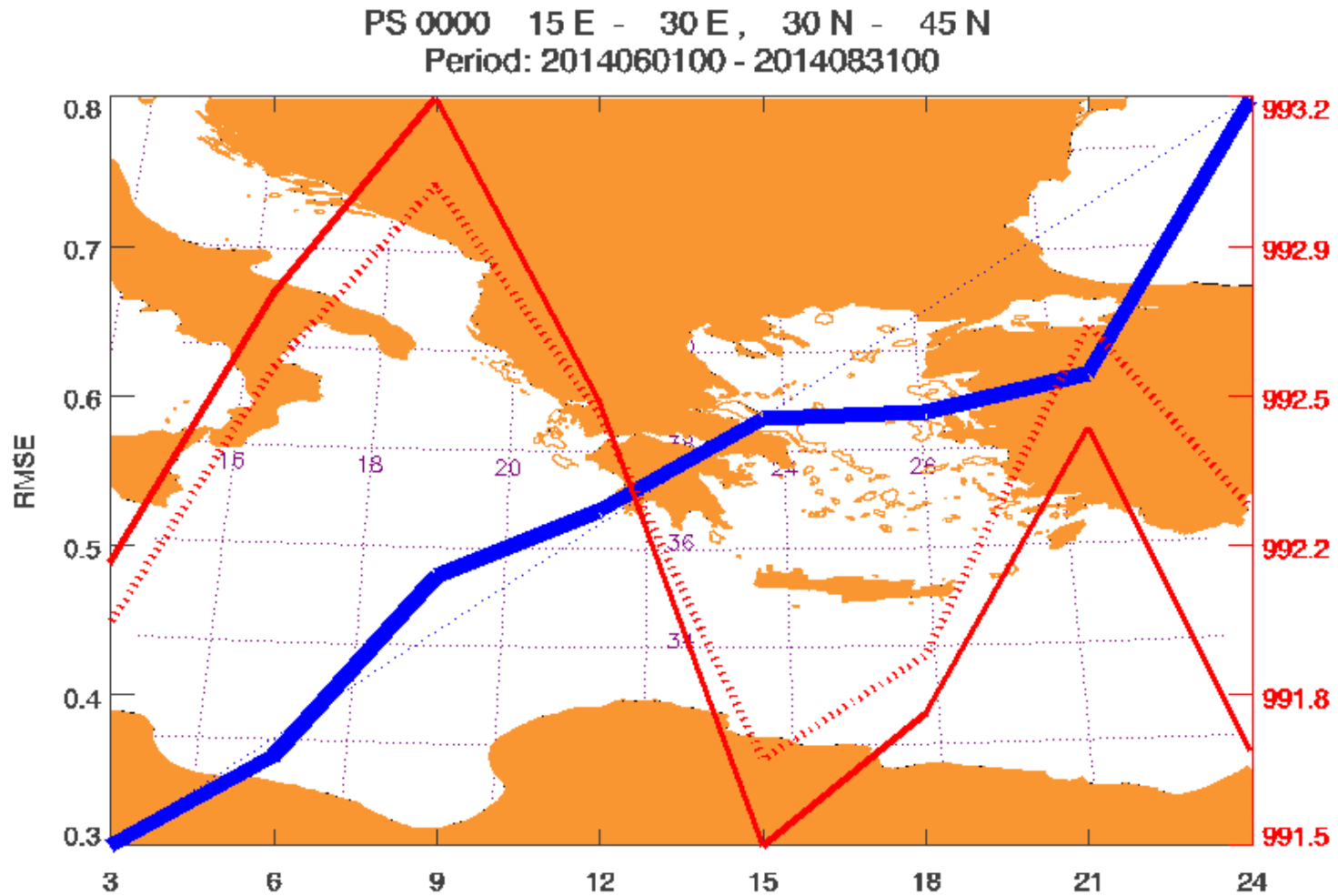


MSLP errors JJA 2014 common area

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



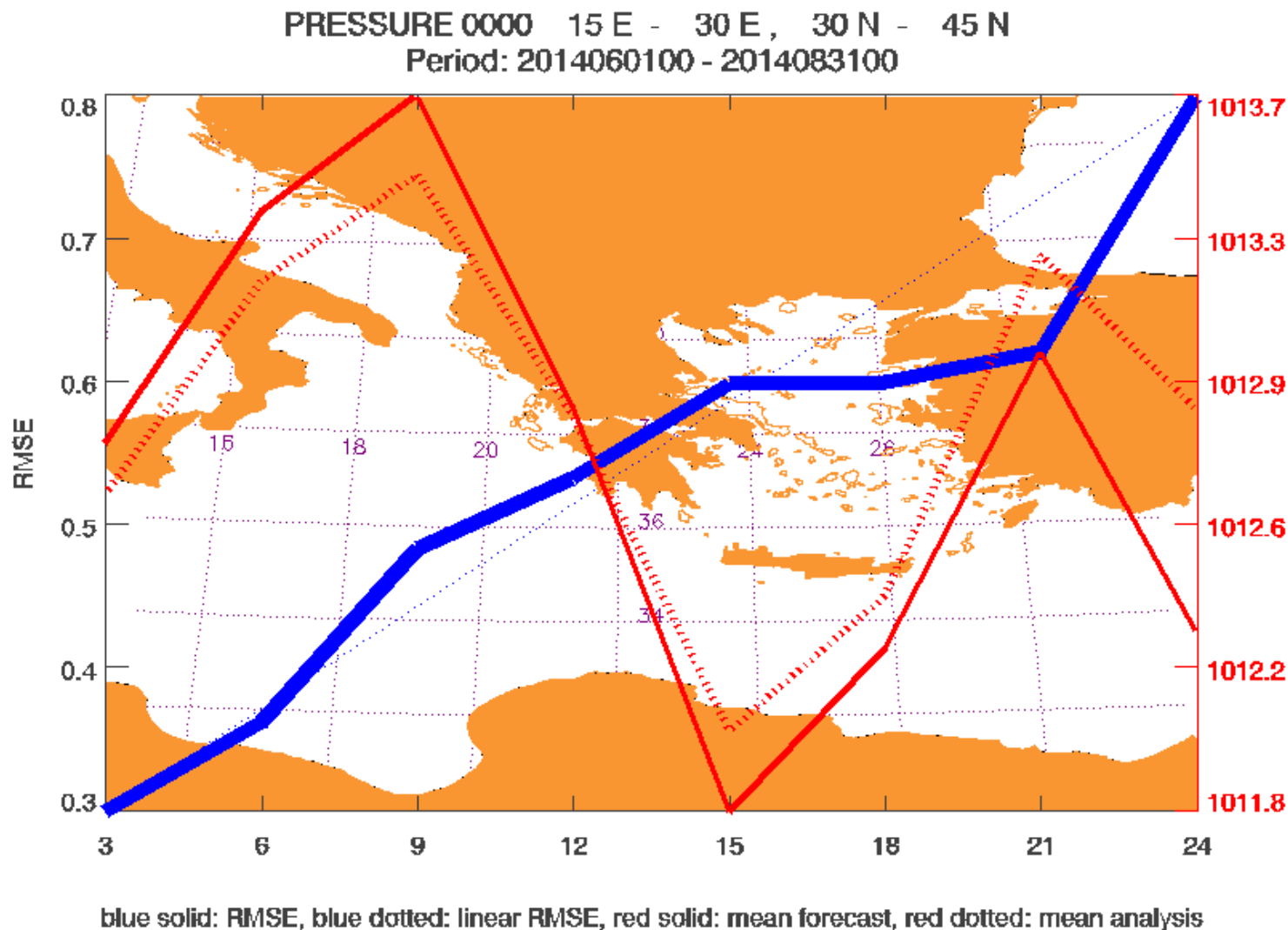
PS errors JJA 2014 GME



blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis

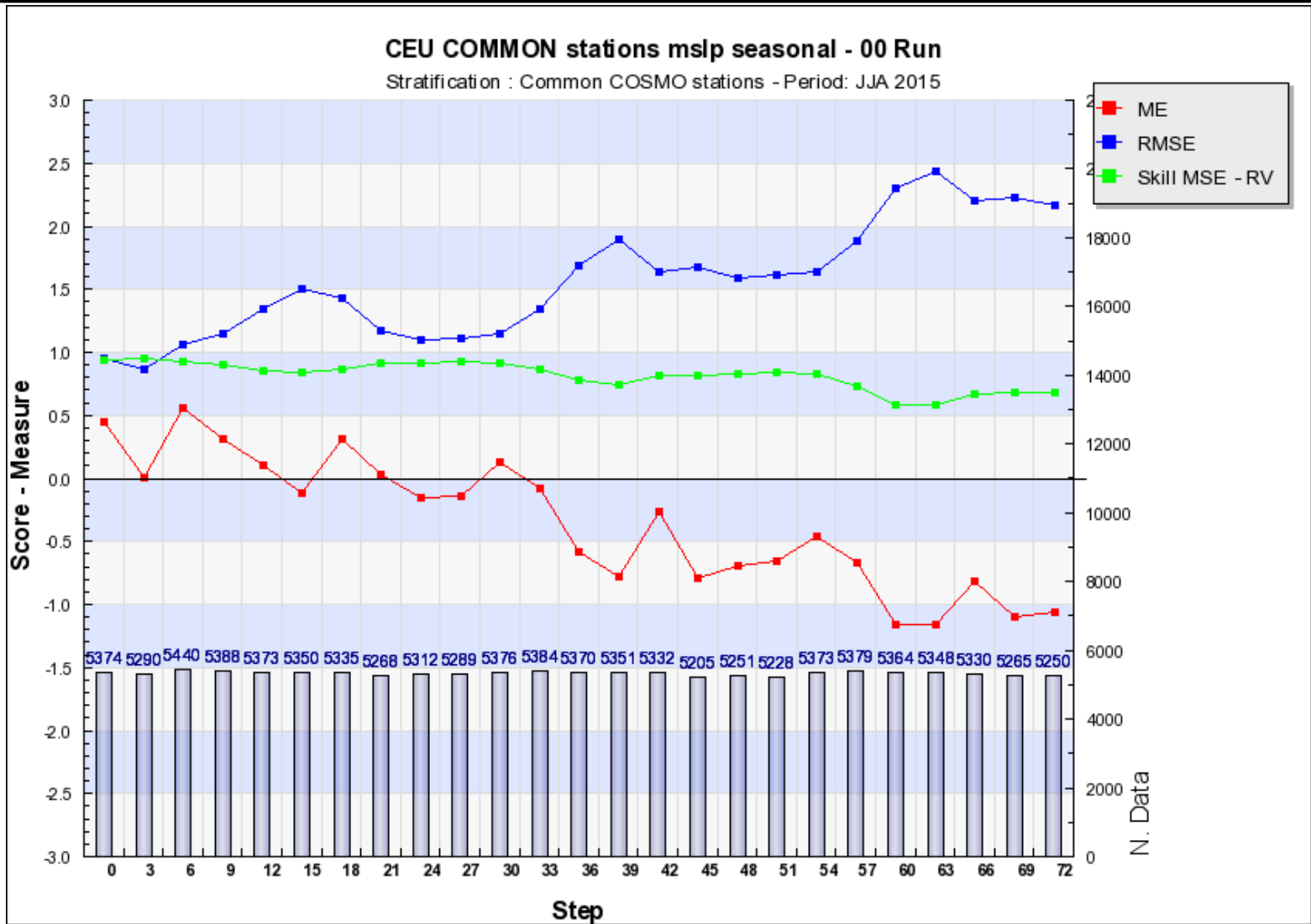


MSLP errors JJA 2014 GME

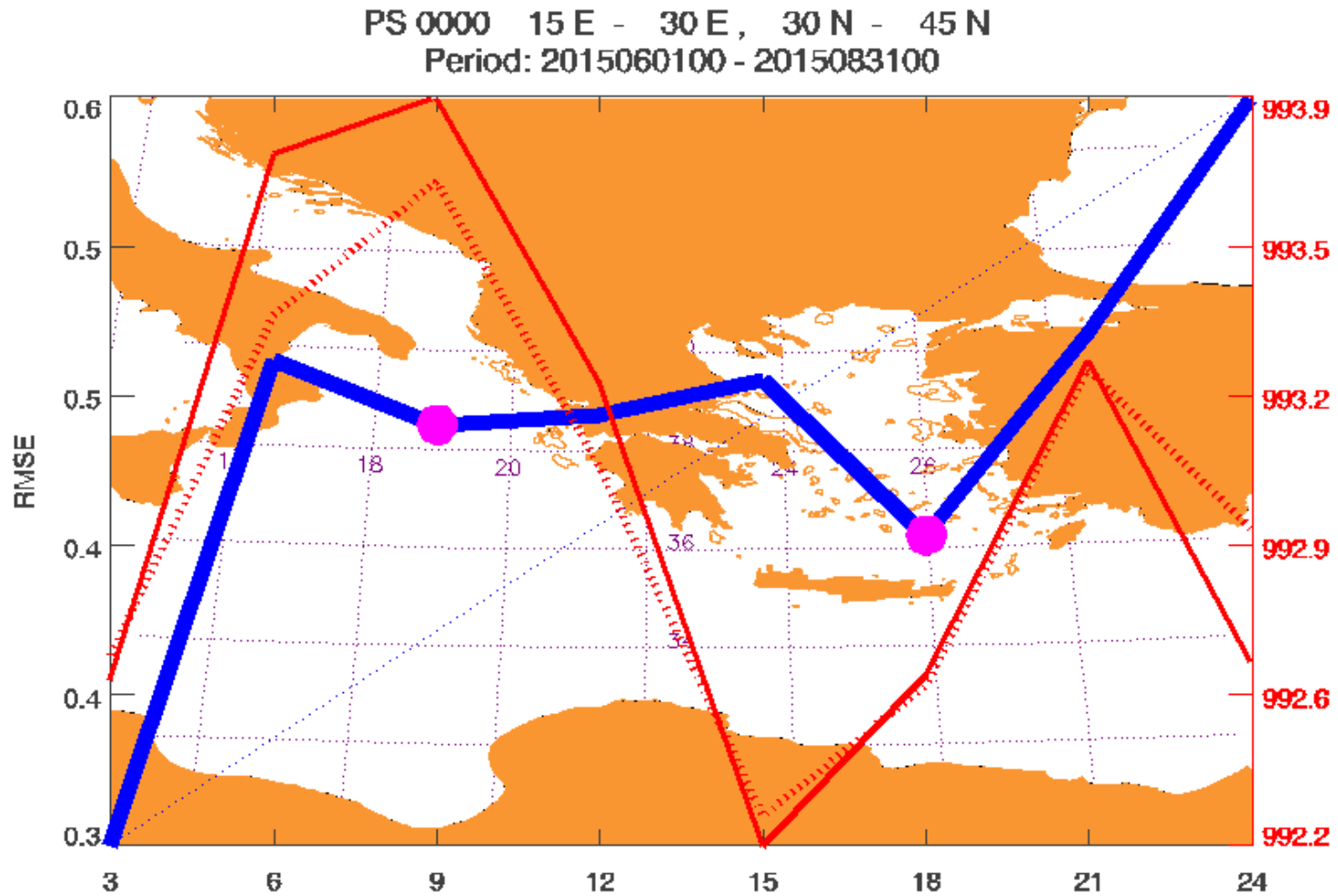


COSMO-EU:

MSLP errors JJA 2015 common area



PS errors JJA 2015 ICON

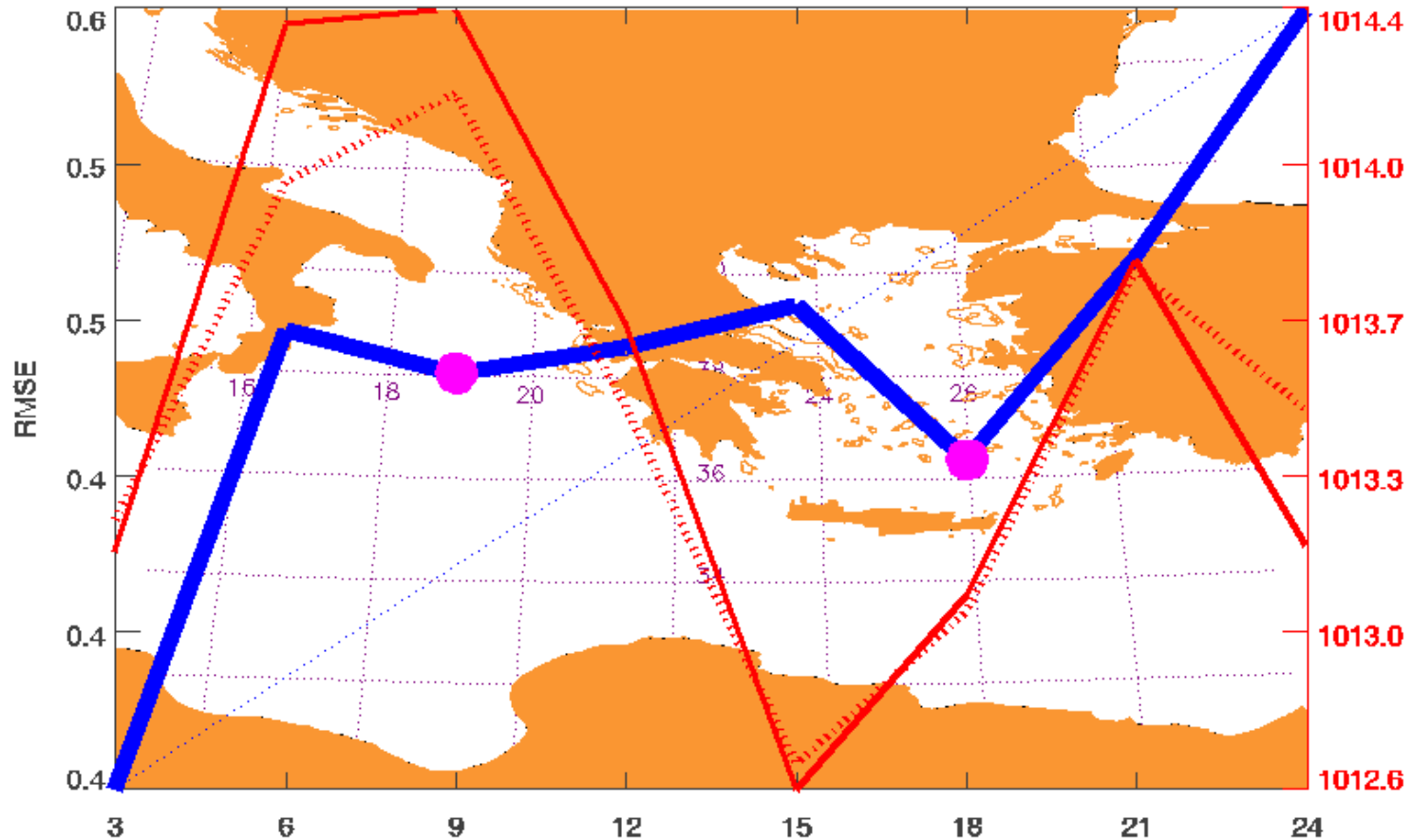


blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



MSLP errors JJA 2015 ICON

PRESSURE 0000 15 E - 30 E, 30 N - 45 N
Period: 2015060100 - 2015083100



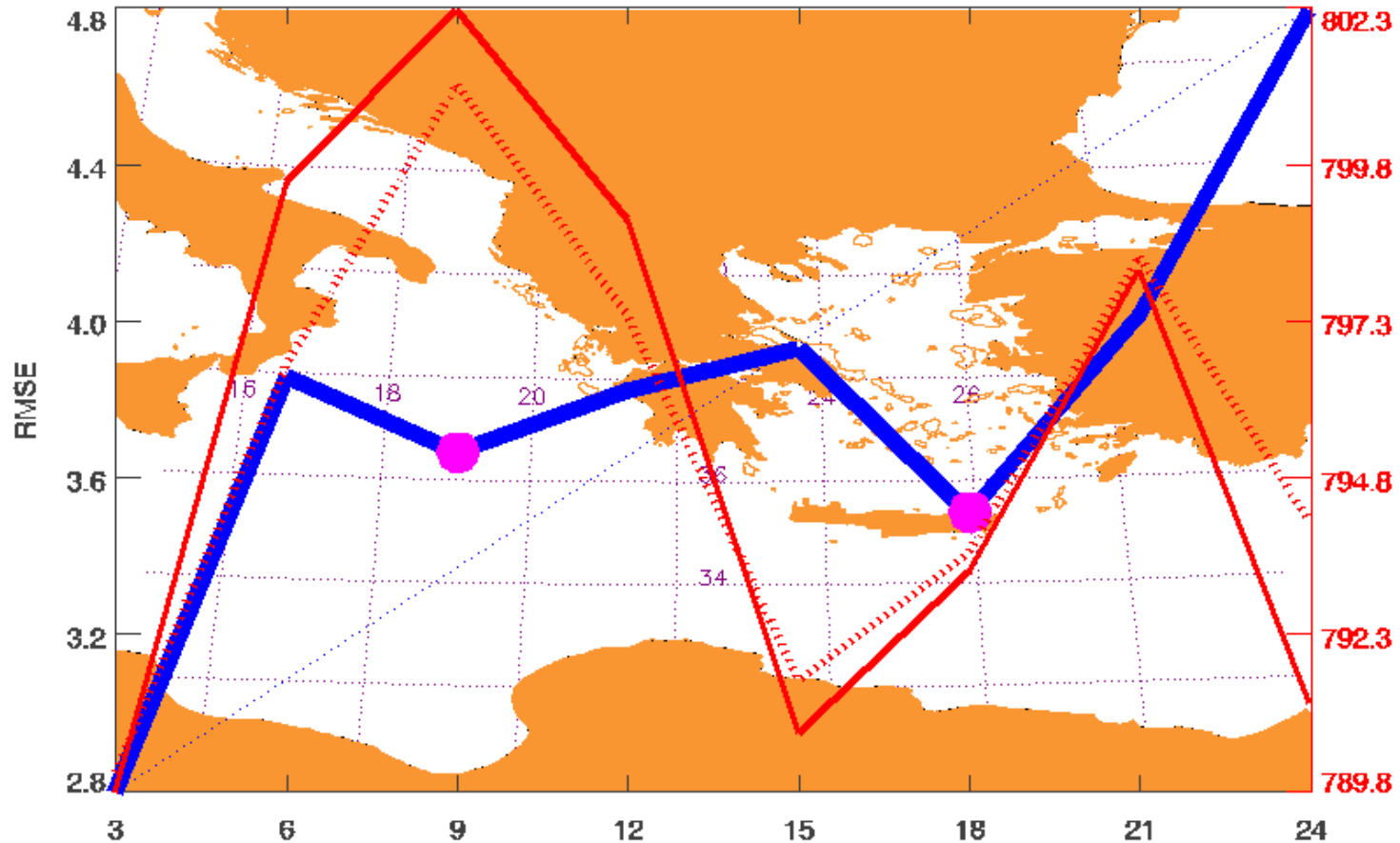
blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Geopotential 925 hPa errors

JJA 2015 ICON

GEOPOTENTIAL 0925 15 E - 30 E, 30 N - 45 N
Period: 2015060100 - 2015083100



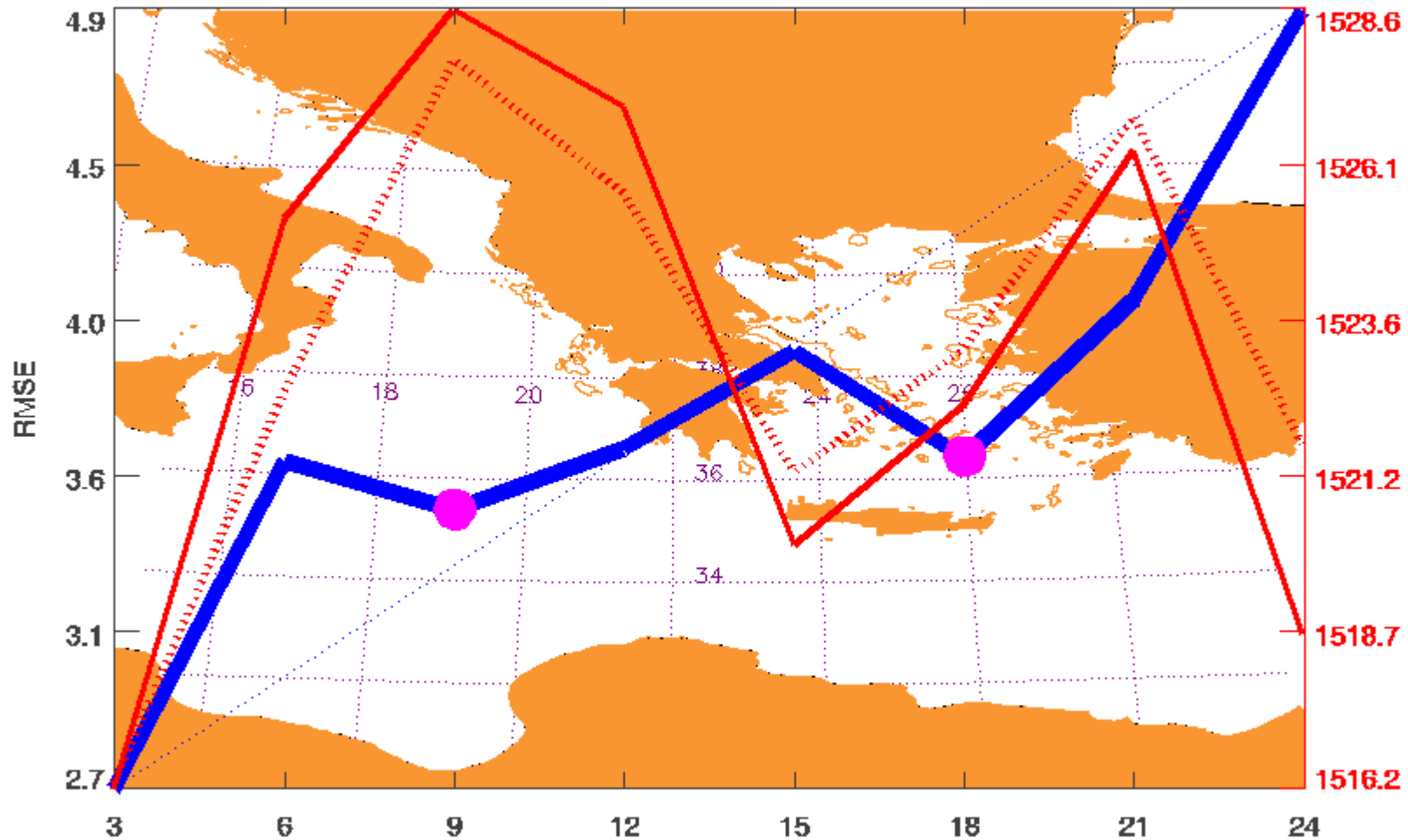
blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Geopotential 850 hPa errors

JJA 2015 ICON

GEOPOTENTIAL 0850 15 E - 30 E, 30 N - 45 N
Period: 2015060100 - 2015083100

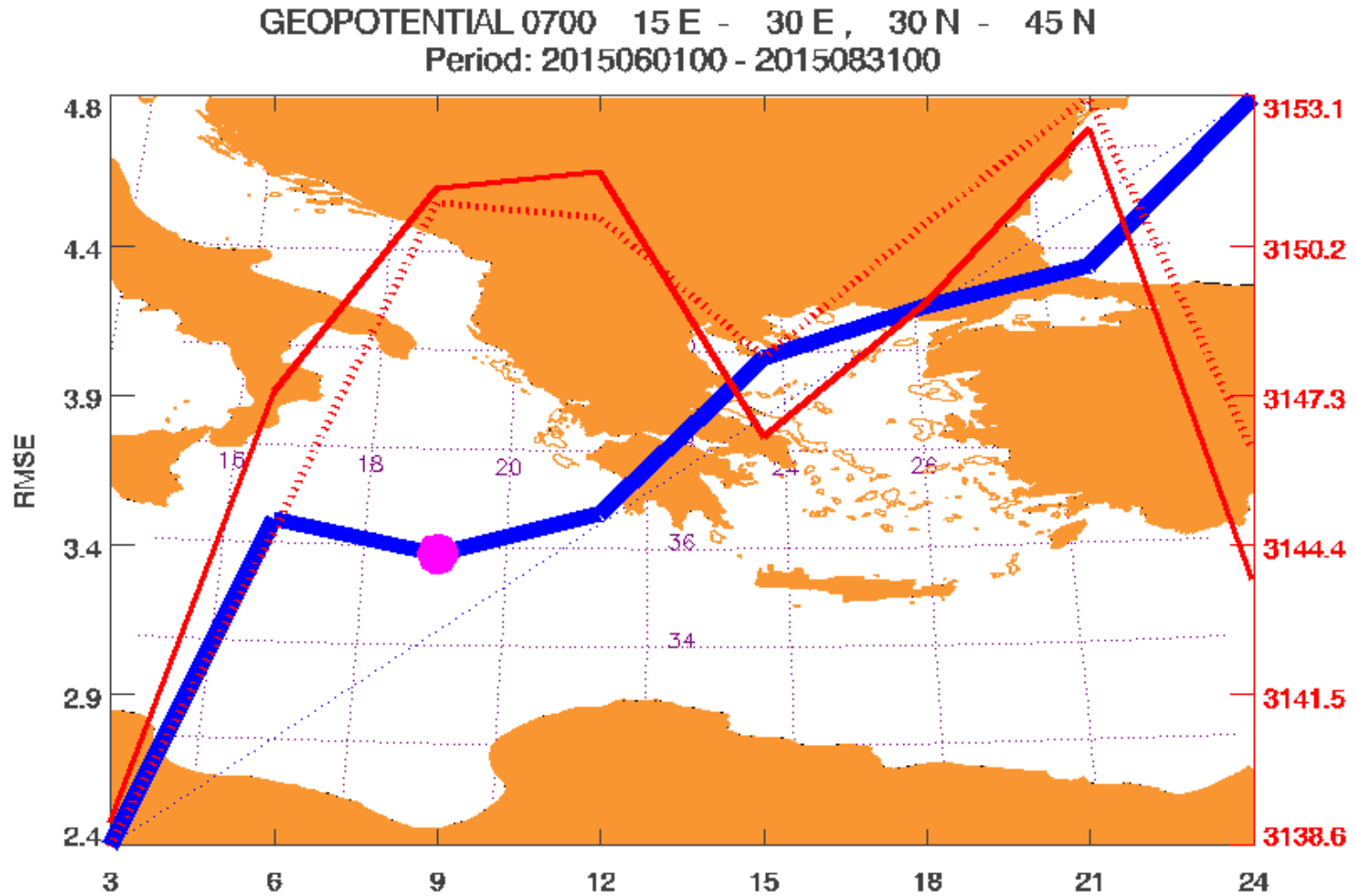


blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis

pressure

Geopotential 700 hPa errors

JJA 2015 ICON

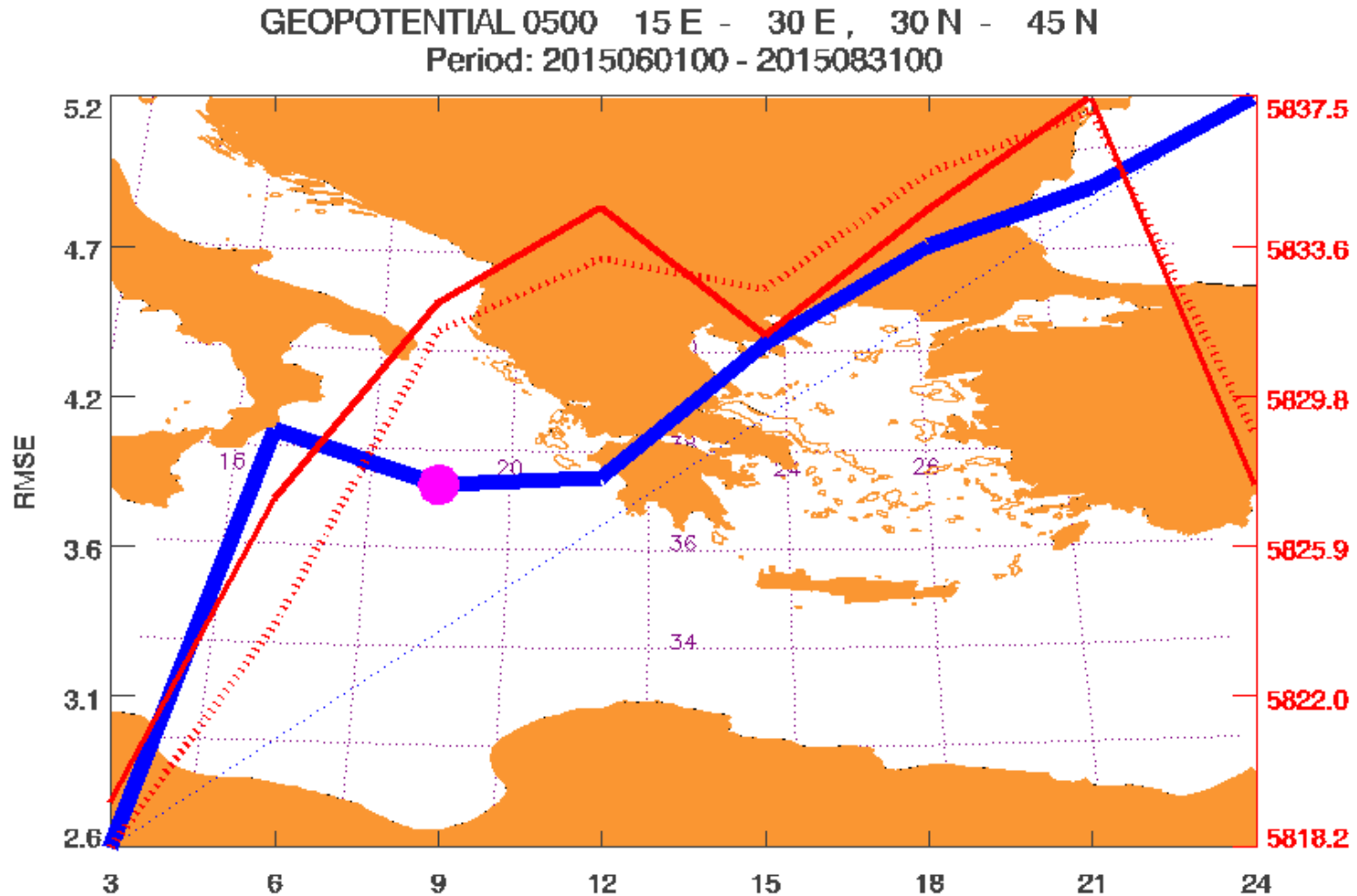


blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Geopotential 500 hPa errors

JJA 2015 ICON

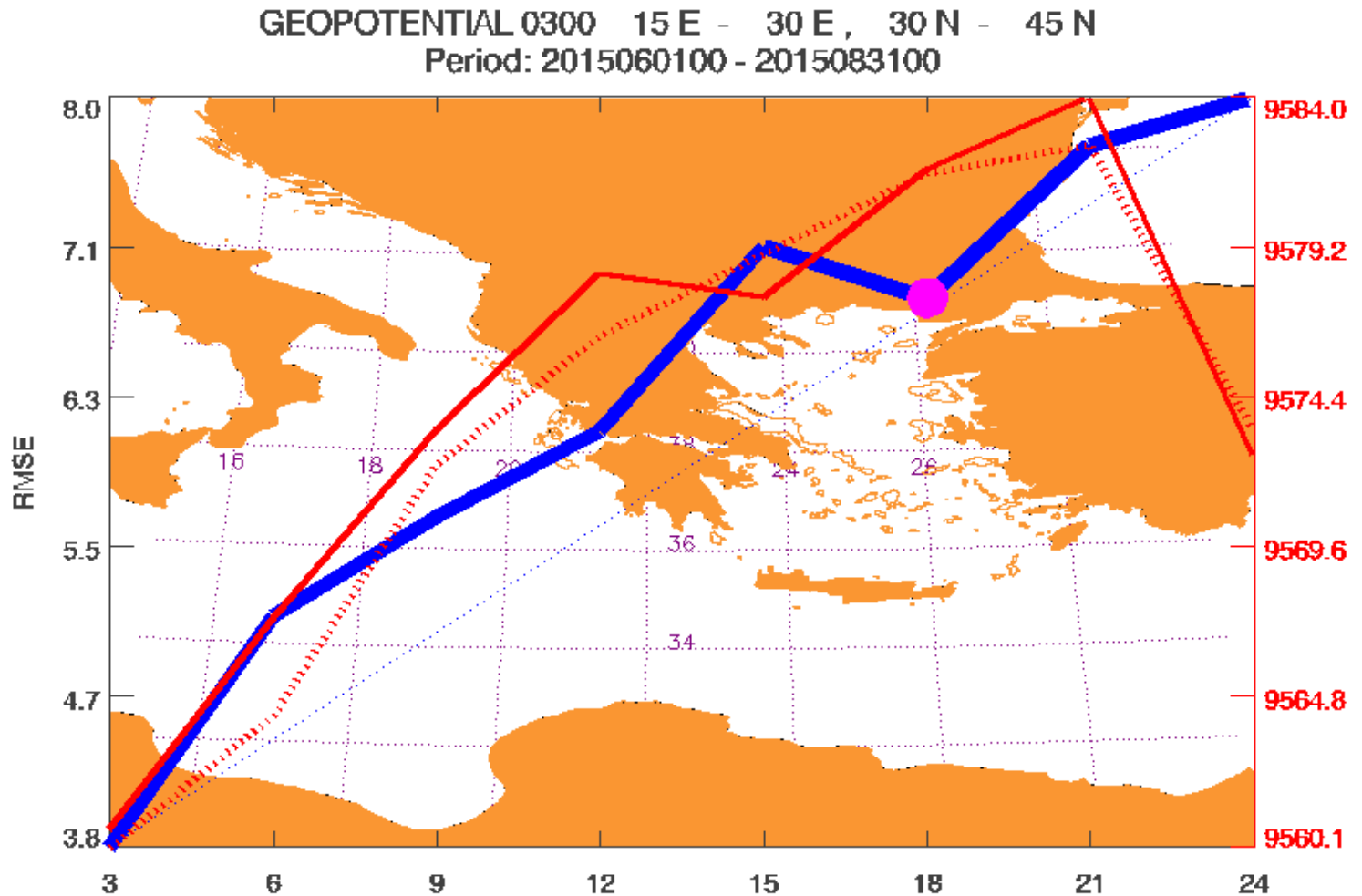


blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Geopotential 300 hPa errors

JJA 2015 ICON

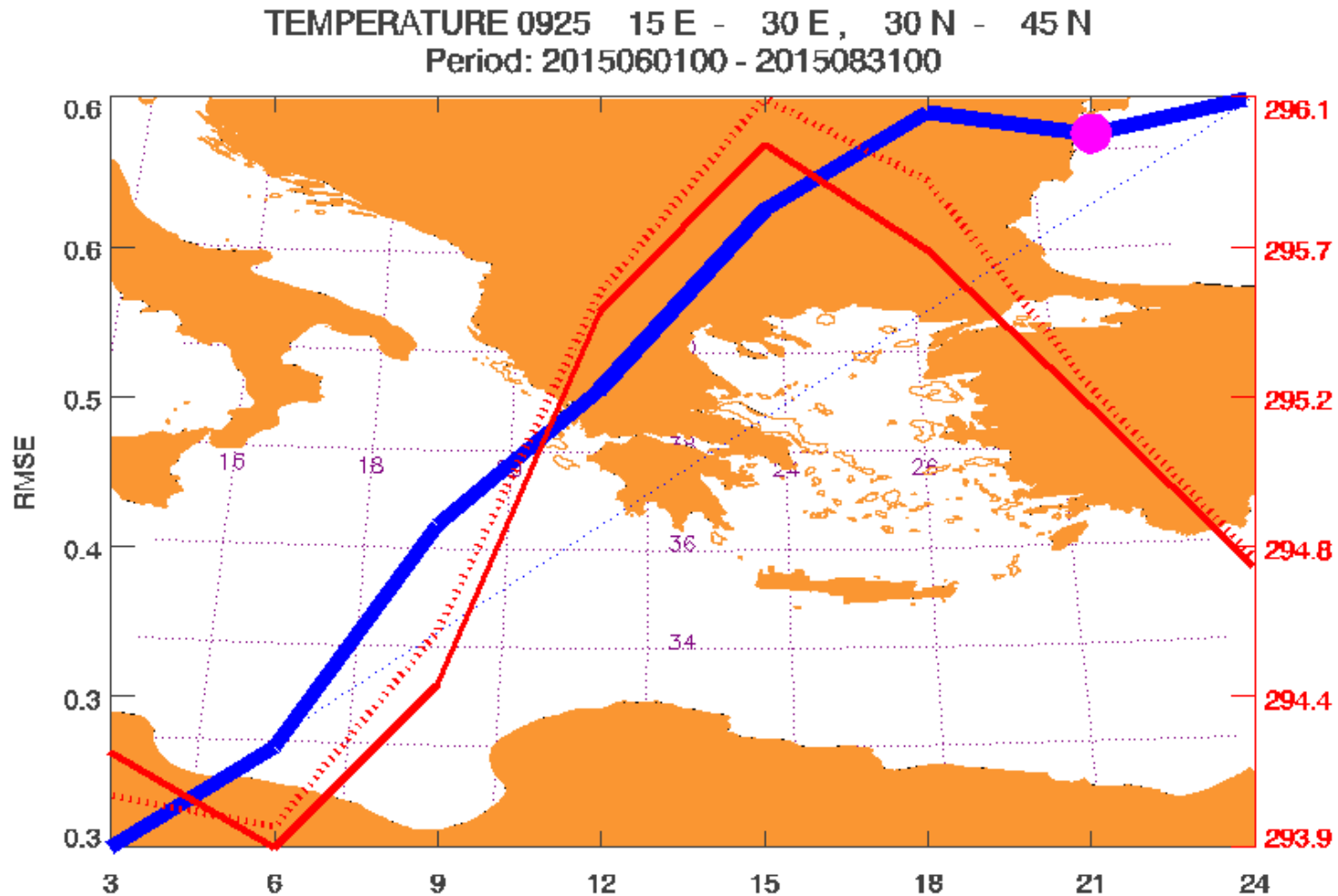


blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Temperature 925 hPa errors

JJA 2015 ICON



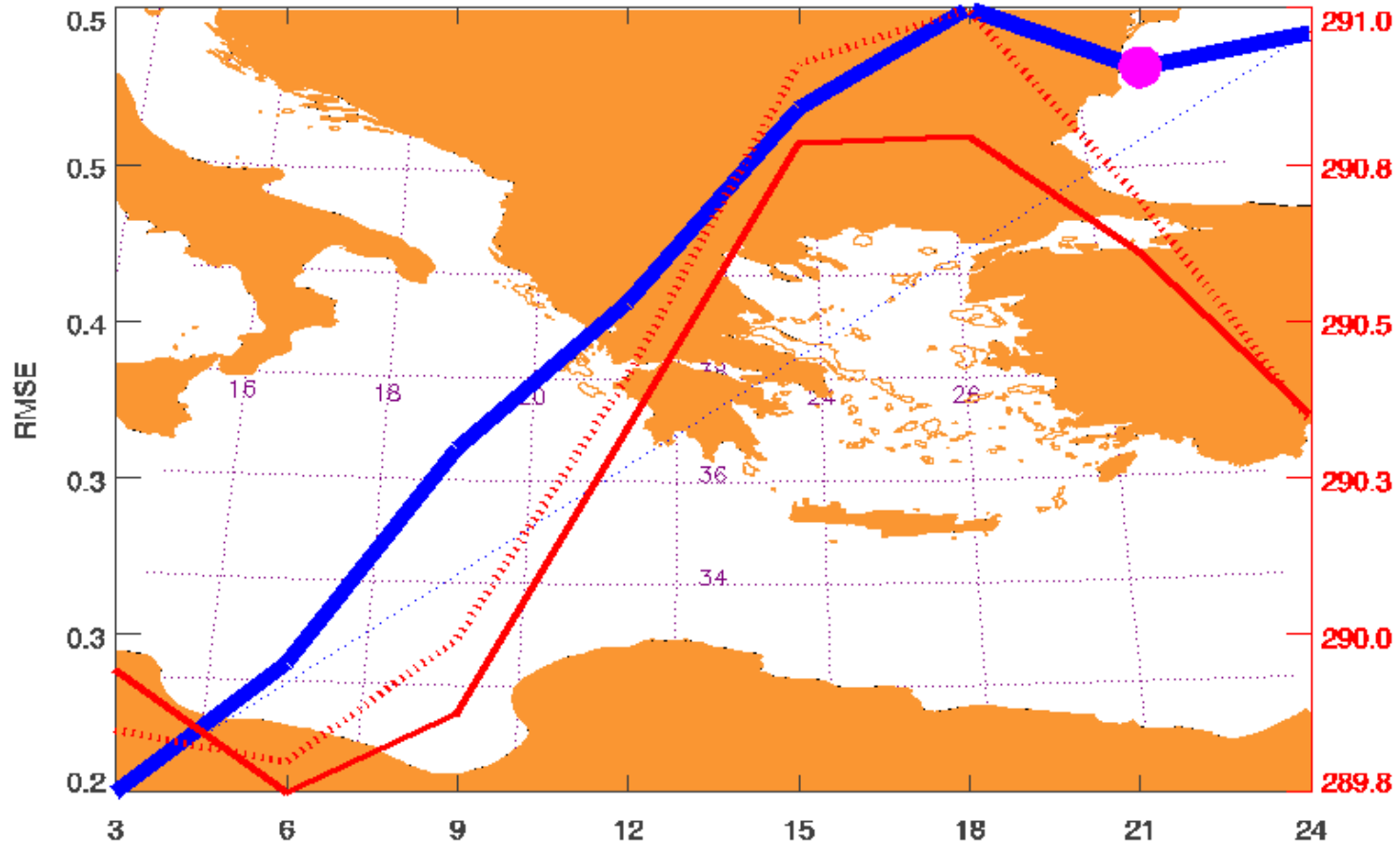
blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Temperature 850 hPa errors

JJA 2015 ICON

TEMPERATURE 0850 15 E - 30 E, 30 N - 45 N
Period: 2015060100 - 2015083100



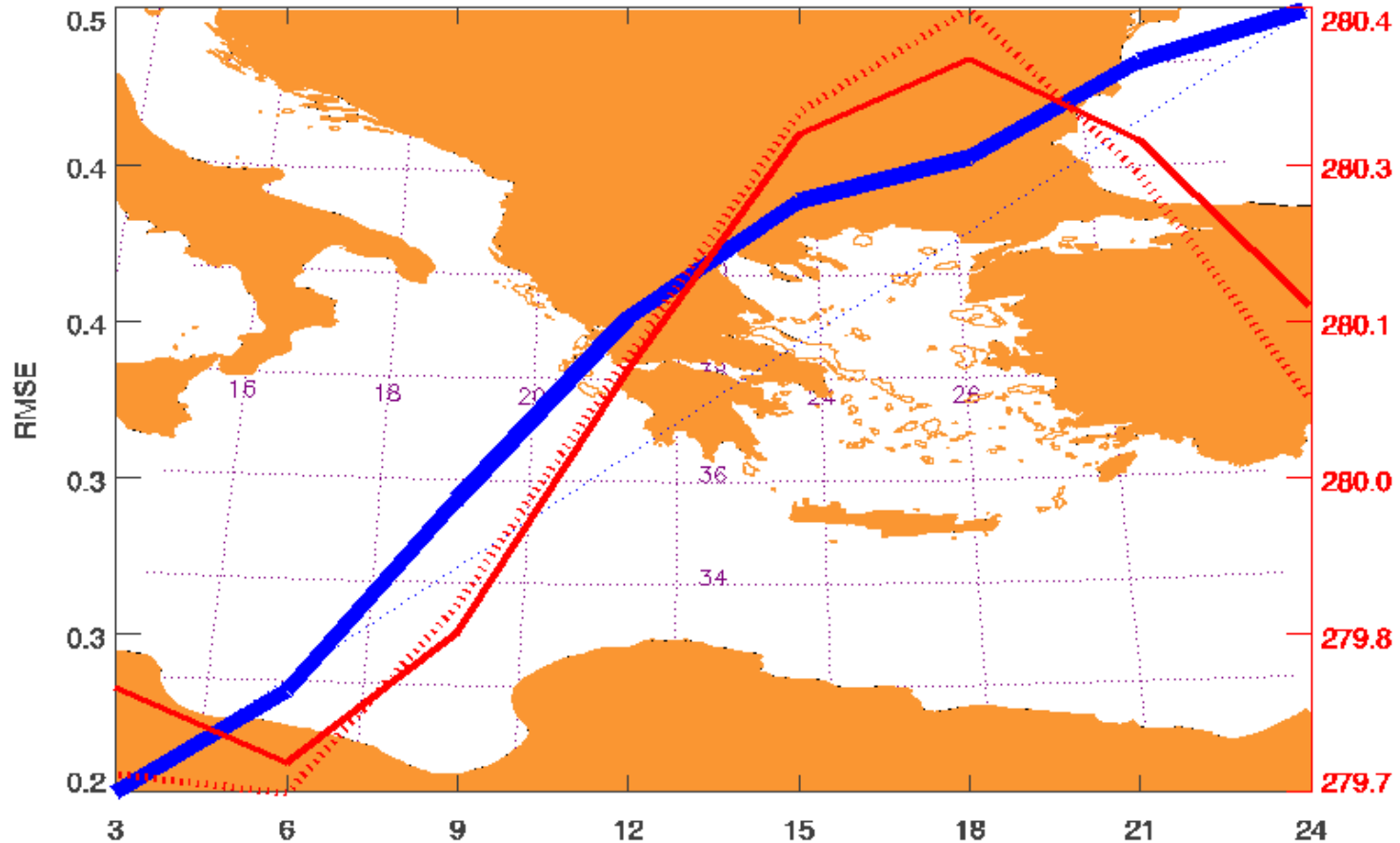
blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Temperature 700 hPa errors

JJA 2015 ICON

TEMPERATURE 0700 15 E - 30 E, 30 N - 45 N
Period: 2015060100 - 2015083100

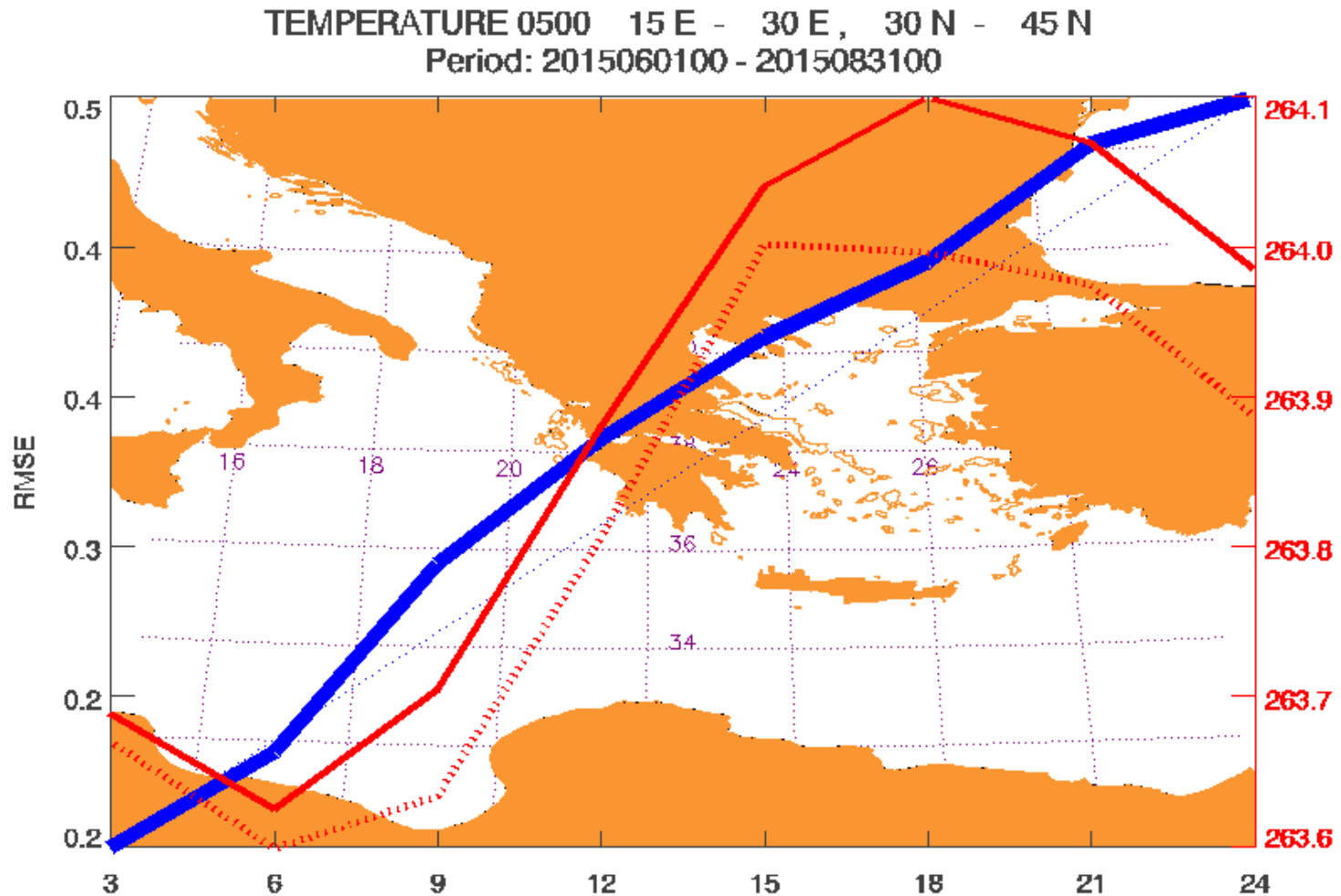


blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Temperature 500 hPa errors

JJA 2015 ICON



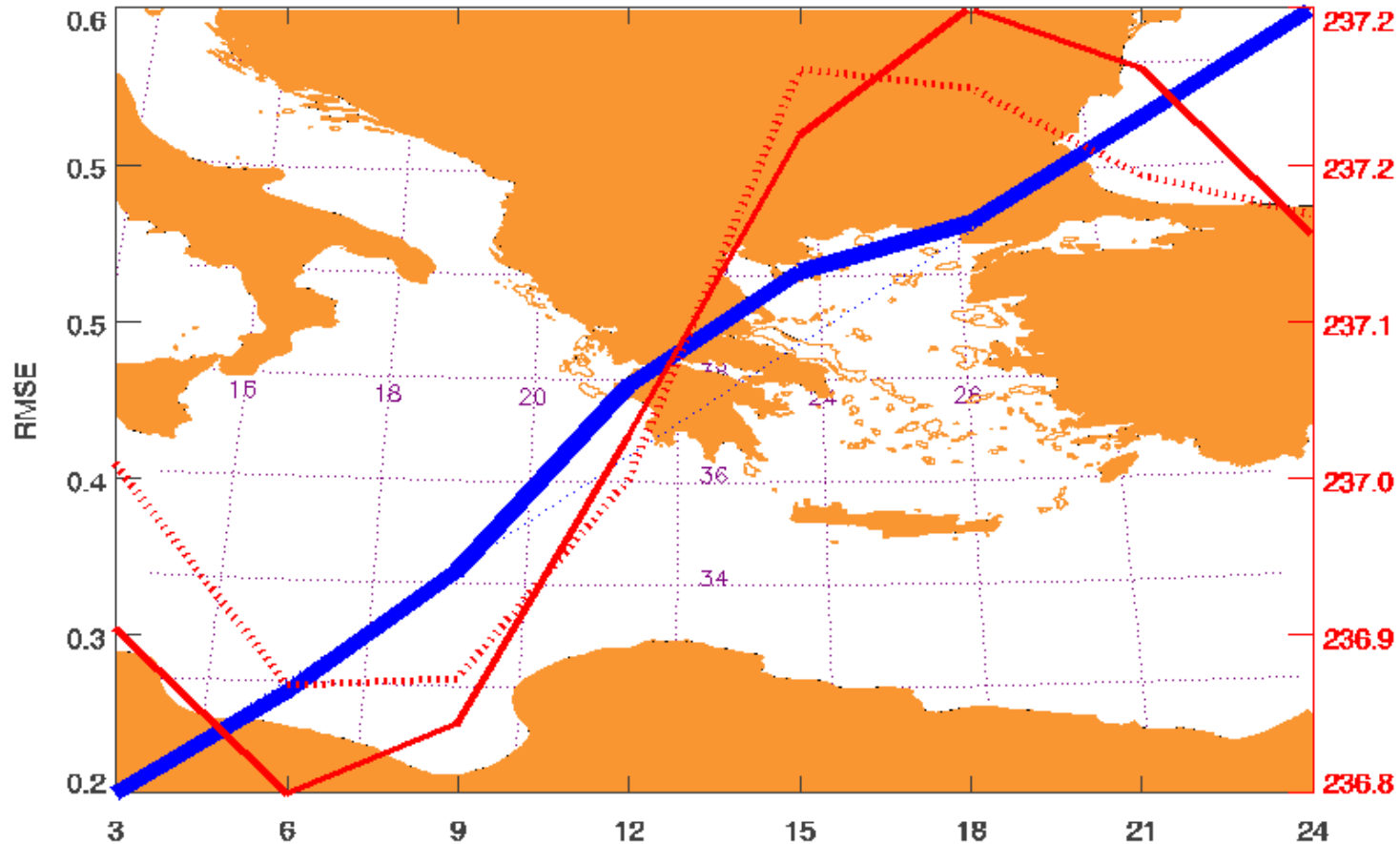
blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



Temperature 300 hPa errors

JJA 2015 ICON

TEMPERATURE 0300 15 E - 30 E, 30 N - 45 N
Period: 2015060100 - 2015083100



blue solid: RMSE, blue dotted: linear RMSE, red solid: mean forecast, red dotted: mean analysis



- **The maximum of RMSE during Summer was also noticed for GME and ICON.**
- **The origin for this error seems to be related to forecast errors in the upper and middle troposphere.**
- **Sorry: Only diagnostics – no real reason was found.**
- **The problem should be delegated to model developers.**
- **Maybe the problem is not so relevant.**

Thank you for your attention!

