

# Evaluation of air quality forecasting system kAIROS over and Italy for year 2021 using DELTA TOOL

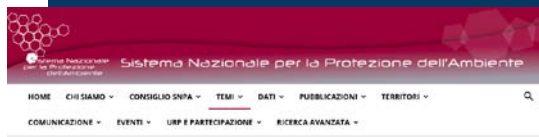
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*FAIRMODE Technical Meeting 4-6 October Athens*

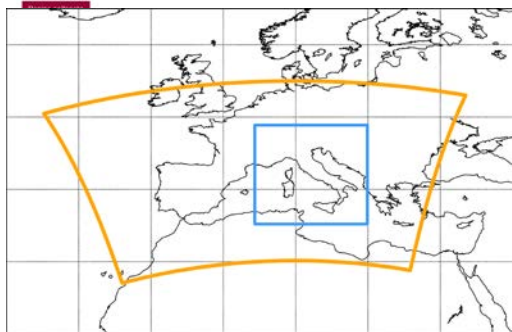


# kAIROS - AIR Operational System SNPA-Arpae

<https://www.snpambiente.it/prodotti/previsioni-qualita-dellaria-in-italia/>



Previsioni qualità dell'aria in Italia



## INPUT

CAMS global IFS

meteo  
COSMO-5M

emissions  
ISPRA,  
CAMS,MEGAN

landuse  
CORINE,  
USGS

CTM  
CHIMERE

OUTPUT: analysis and forecast +72h

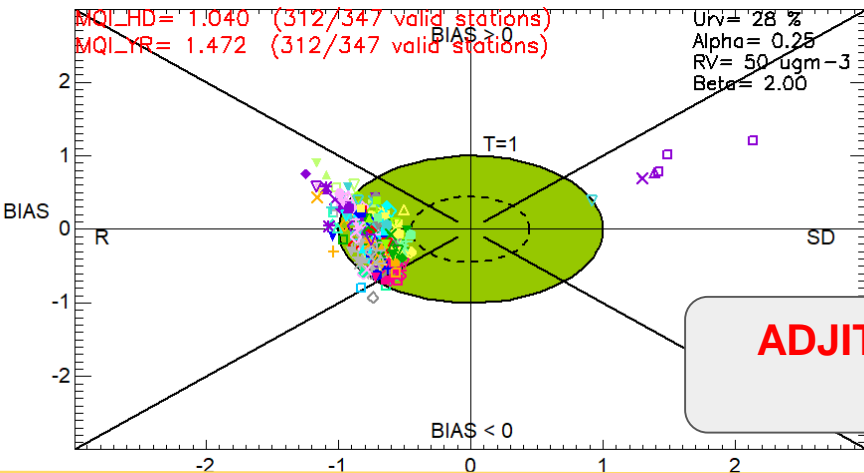
kAIROS, FORAIR-IT (ENEA), CHIMBO (CNR) are the models used in **NCP project CAMS2\_72IT**. The aim of the project is to help users to use Copernicus products in the best way: CAMS\_REG, Emission, Air Control Toolbox, etc.

# Delta tool approach for forecast validation

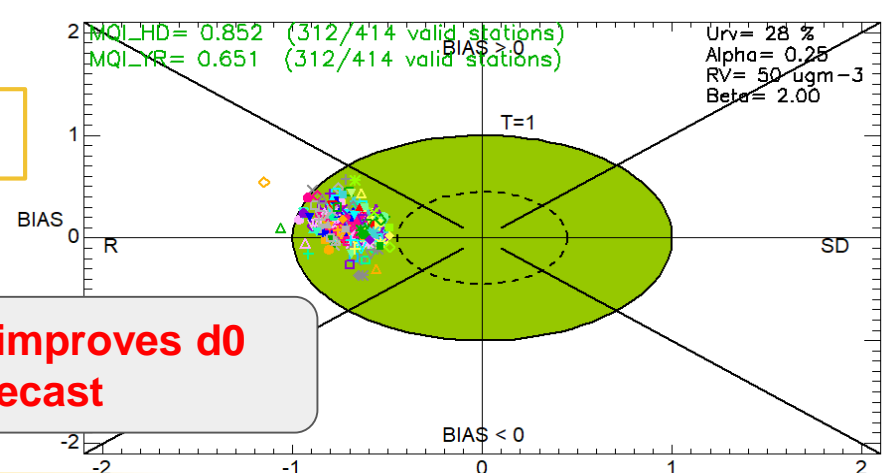
- Evaluation standard assessment MQO
- Comparison with persistence model

We analyse PM10 forecast d0 and d2 for italian background stations

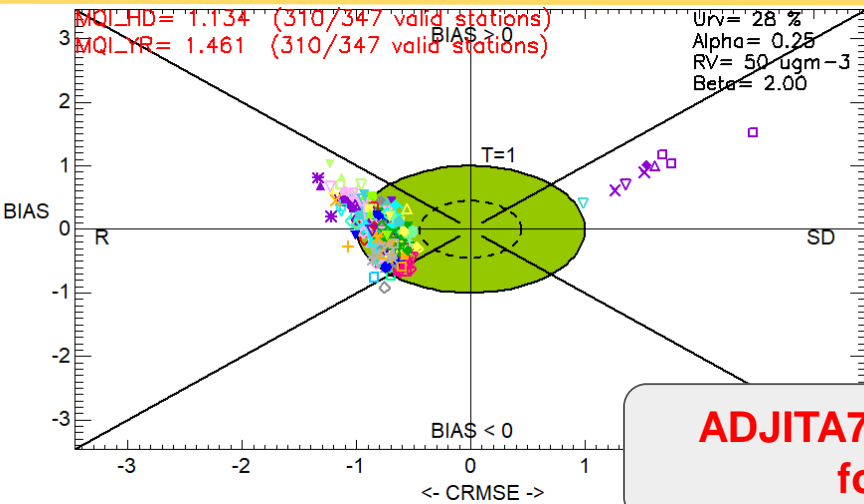
We compare ITA7 (7km horizontal resolution) and ADJITA7 which is the ITA7 model output “correct” with d-1 bias



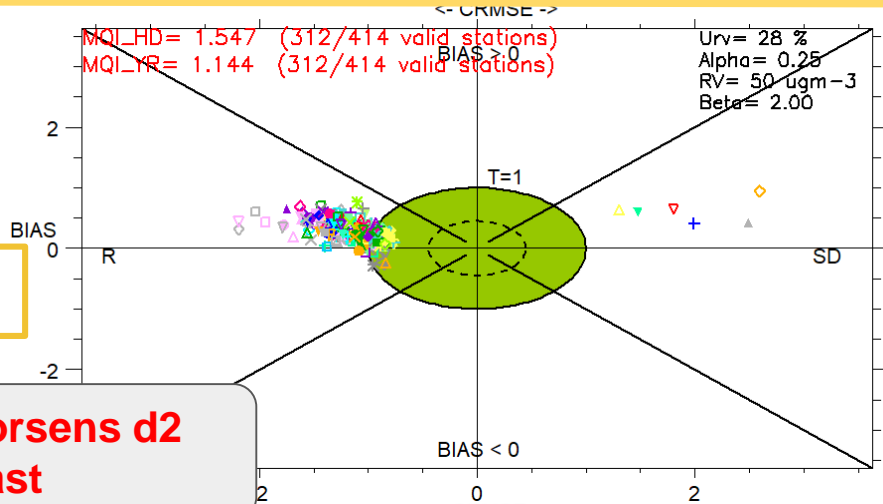
d0



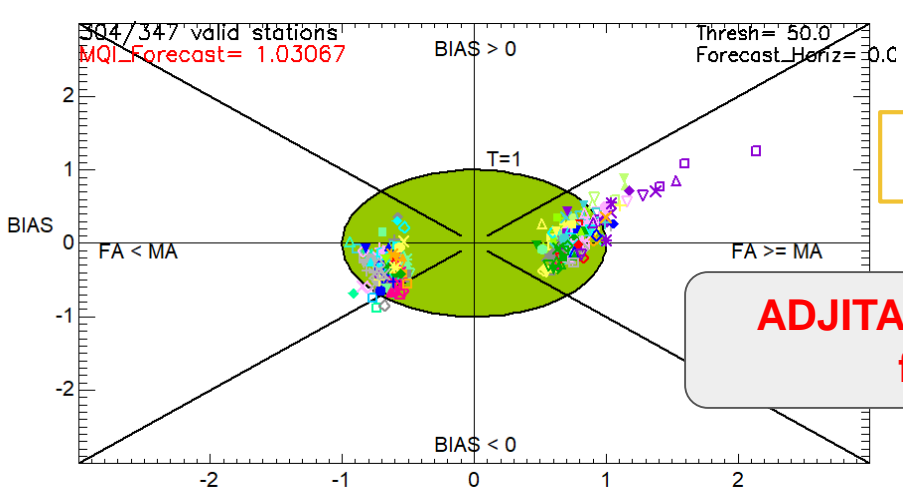
**ADJITA7 improves d0 forecast**



d2

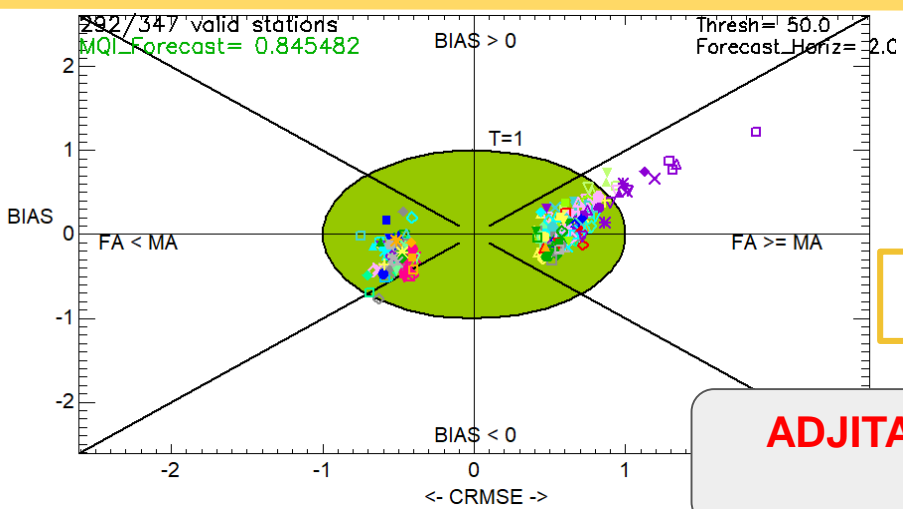
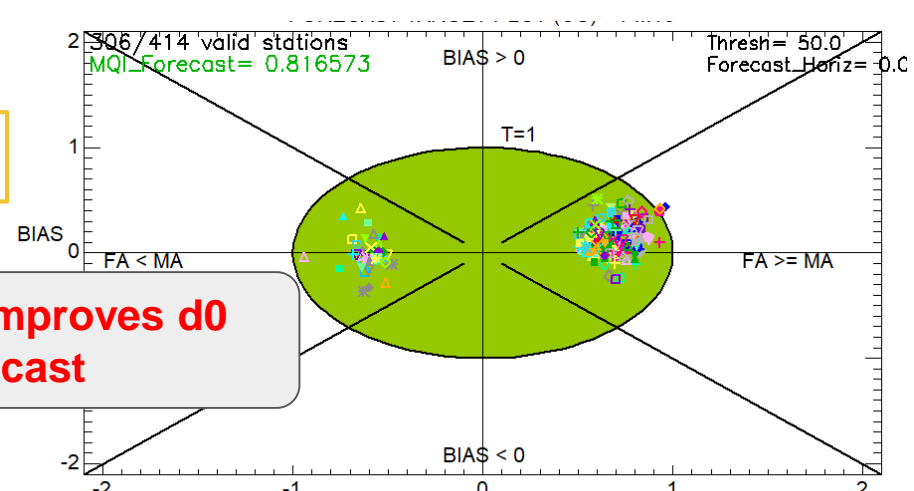


**ADJITA7 worsens d2 forecast**



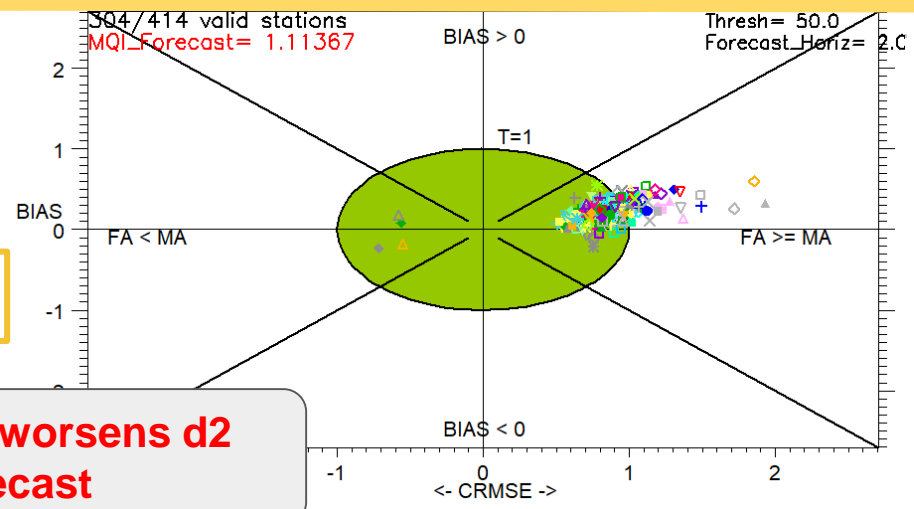
d0

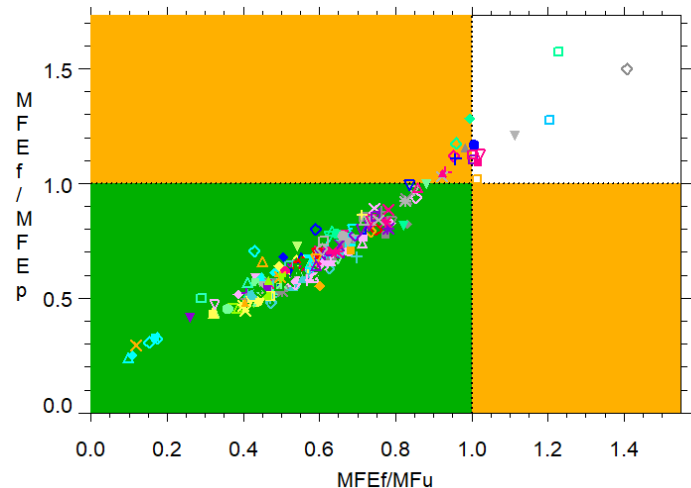
**ADJITA7 improves d0 forecast**



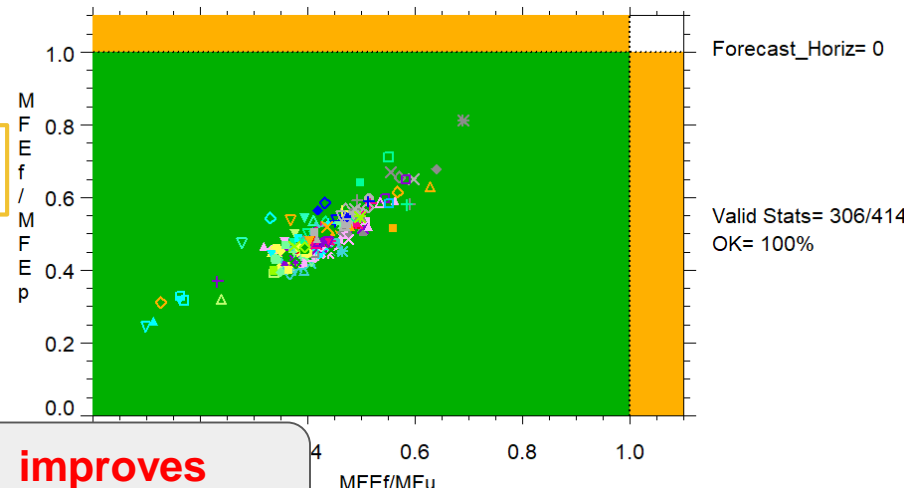
d2

**ADJITA7 worsens d2 forecast**

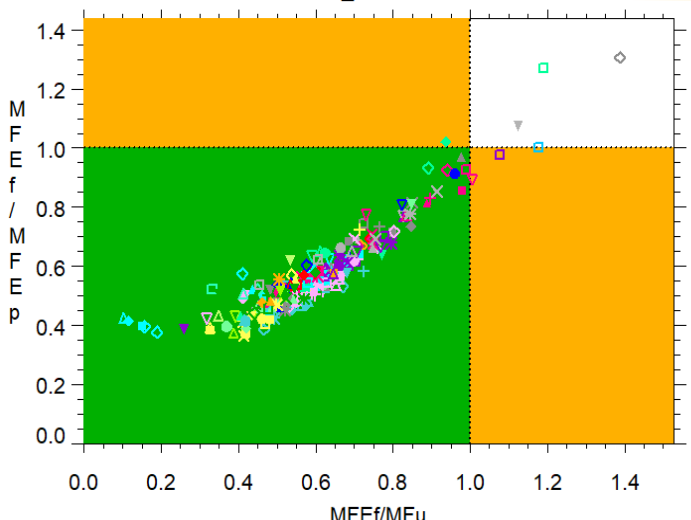




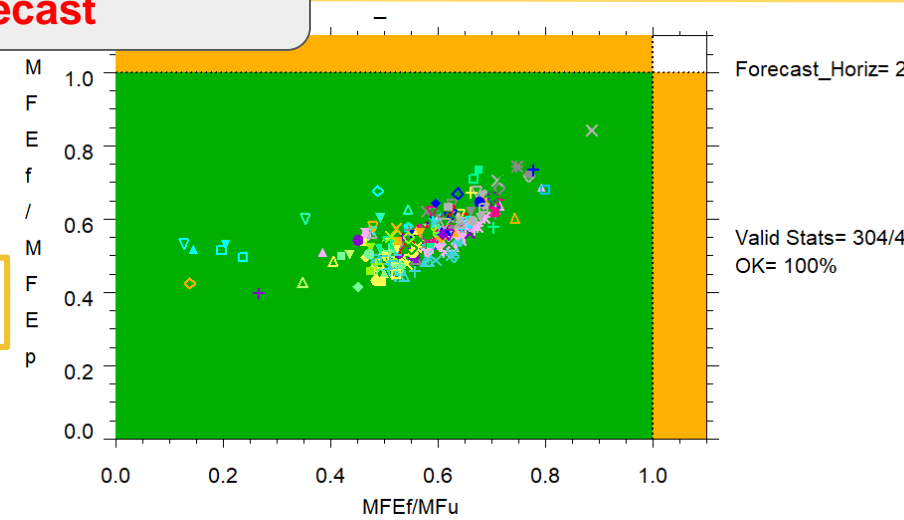
d0

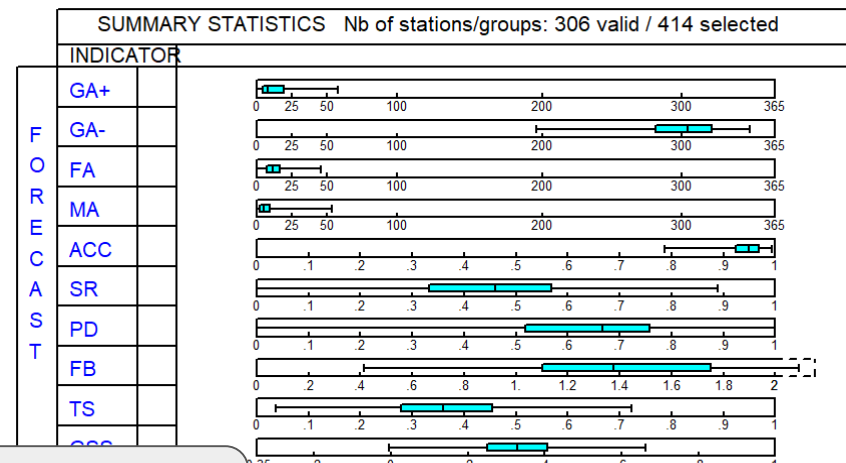
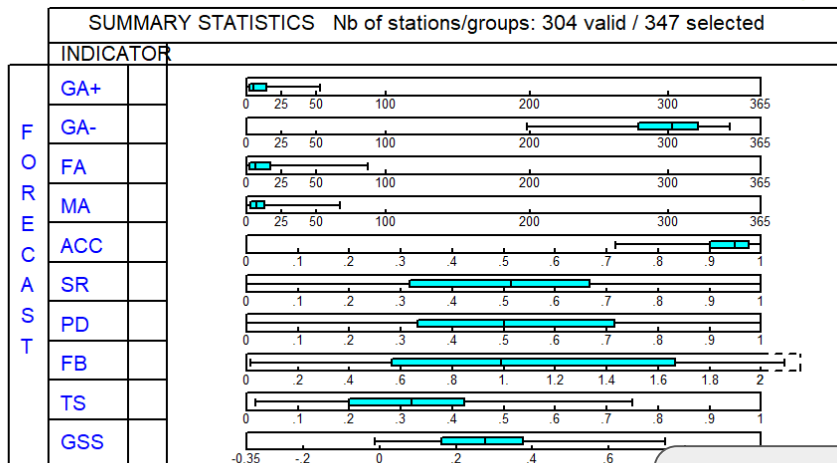


**ADJITA7 improves forecast**



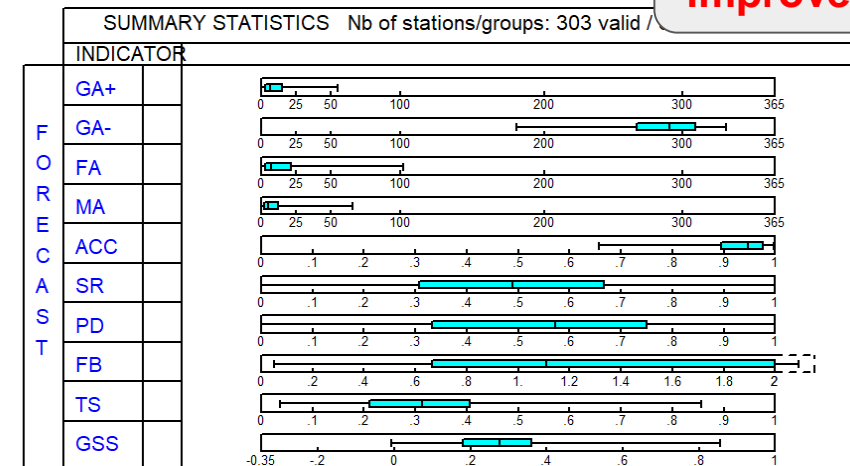
d2



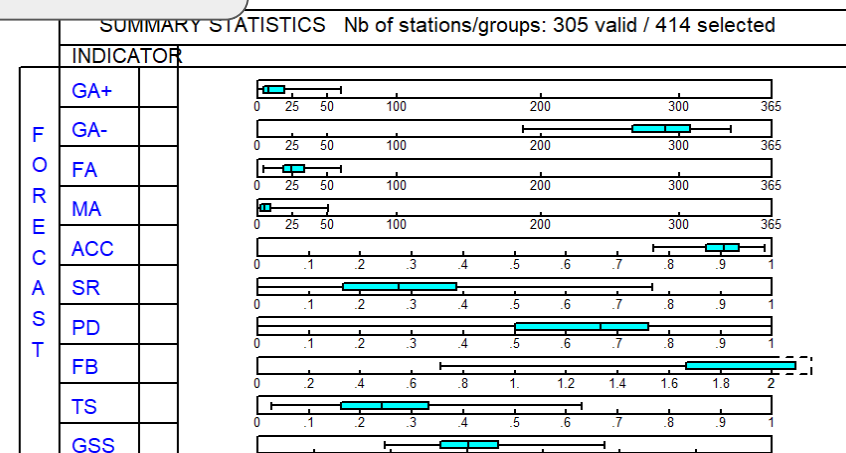


d0

**Good ACC, ADJITA7 improves PD, worsens SR**



d2



# Conclusion

kAIROS model simulation on italian domain was evaluated by means of the Forecast Indicators proposed by FAIRMODE

- good quality with some room for improve PM10 forecast
- strengths and weaknesses of postprocessing approach using d-1 bias

Future Work:

- further investigation concerning the pollutant episode and other pollutants
- group mode analysis (region, station type, etc.)

# Remarks

- Forecast MPI are very good compared with other indicators. Are there too easy to comply?
- Are really necessary MQI three digits after comma? MQO is really not fulfilled if e.g. MQI=1.040?
- *User-modifiable scripts to execute plots would be very useful!*