Score verification issues
an example

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ECMWF

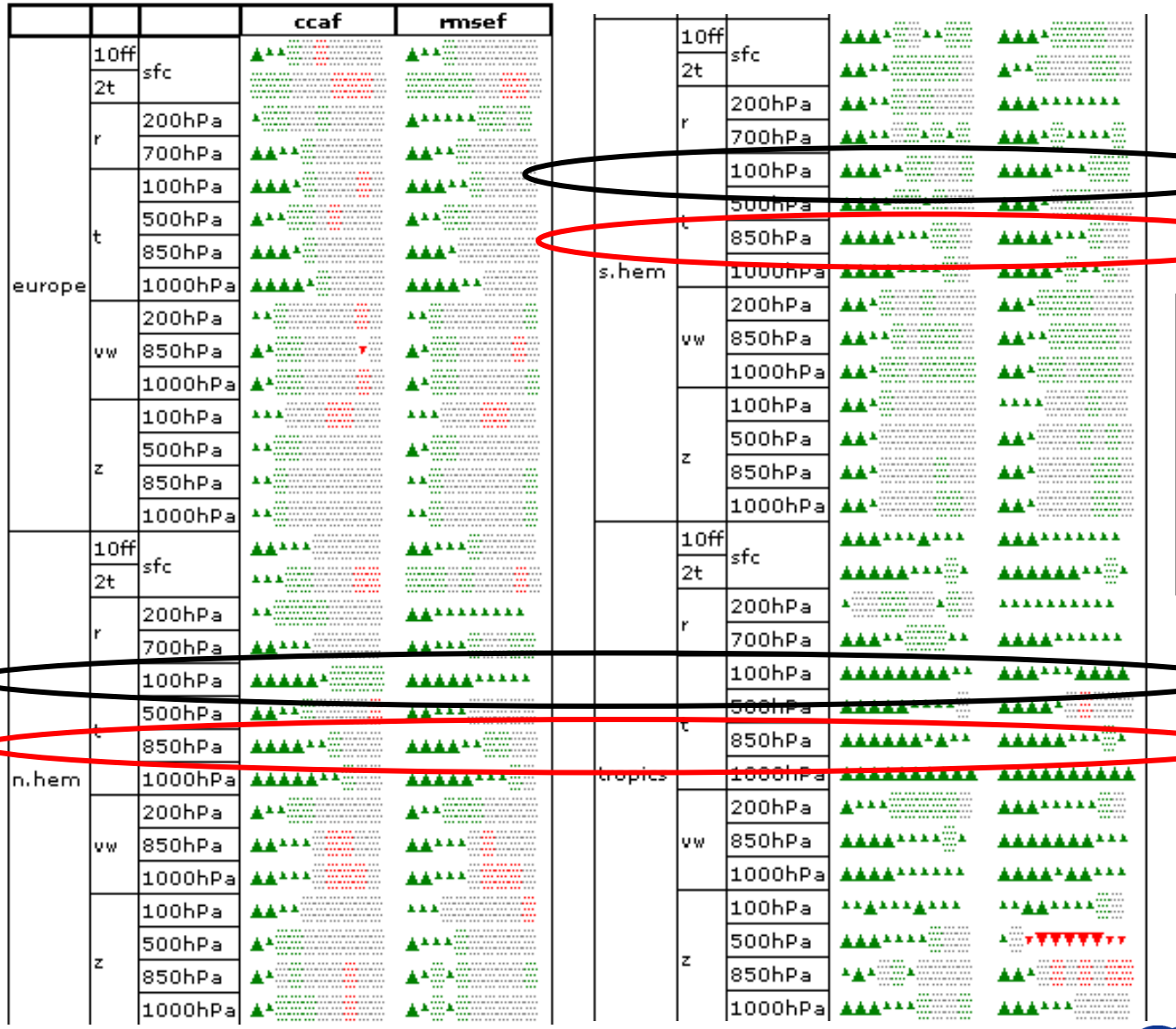
October 2012

and many colleagues from ECMWF

(special thanks to Gabor Radnoti, Martin Janousek, Tony McNally)

Cycle 38R1: High-resolution scores

2011/09/02-2011/12/21, verified with own analysis



An excellent recent model cycle implementation (verified against own analyses)

T@100hPa

T@850hPa

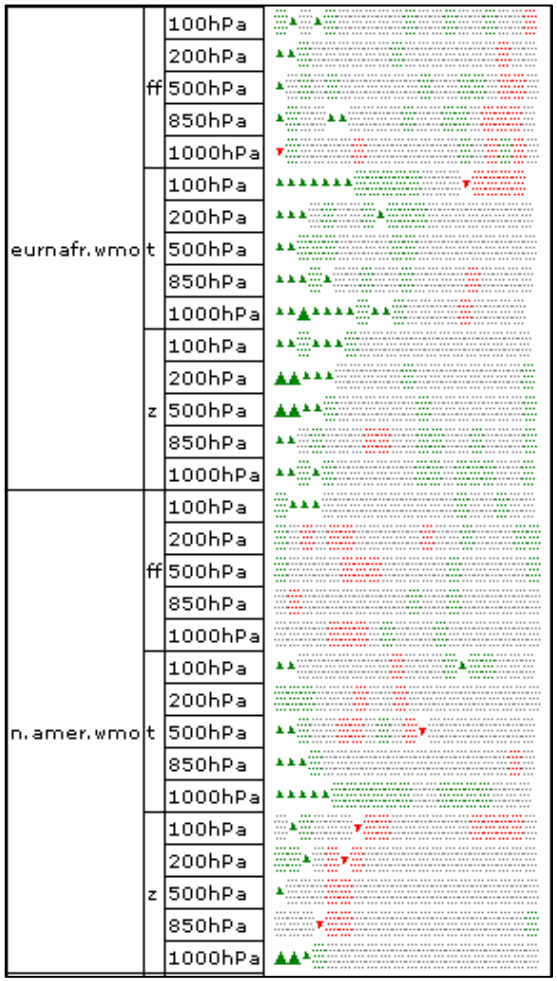
Thanks to Martin Janousek

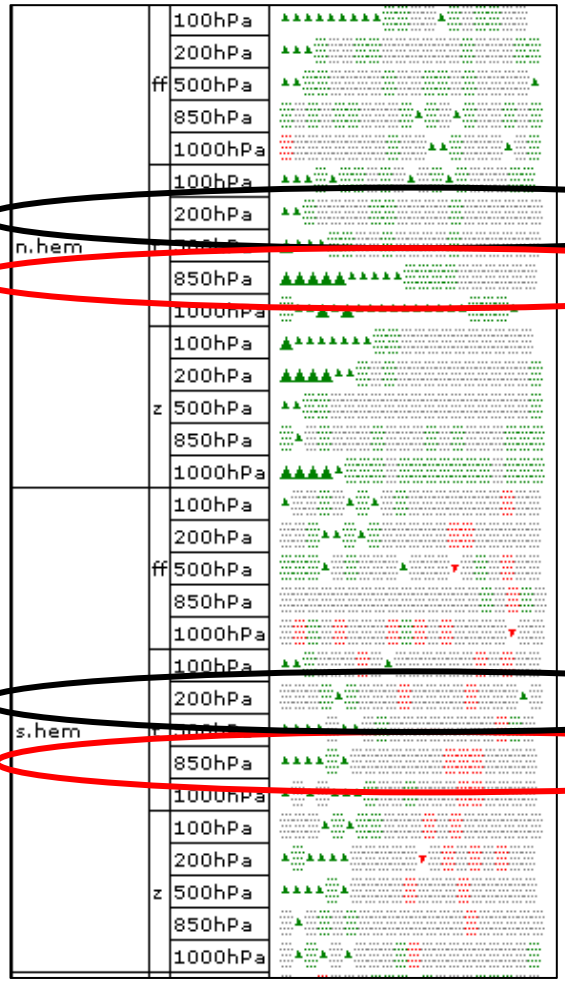
ECMWF

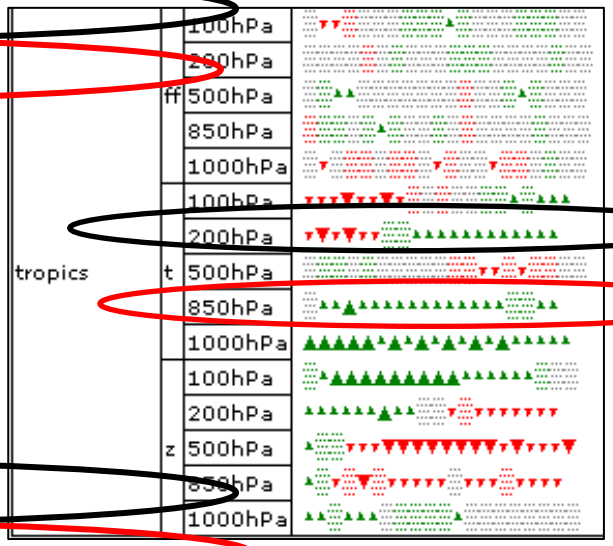
Cycle 38R1: High-resolution scores

2011/09/02-2011/12/31, verified with observations

only 12-hourly rmse







A reasonably good recent model cycle implementation (verified against observations)

Thanks to Martin Janousek

ECMWF

Relevance of own analysis for verifying forecasts

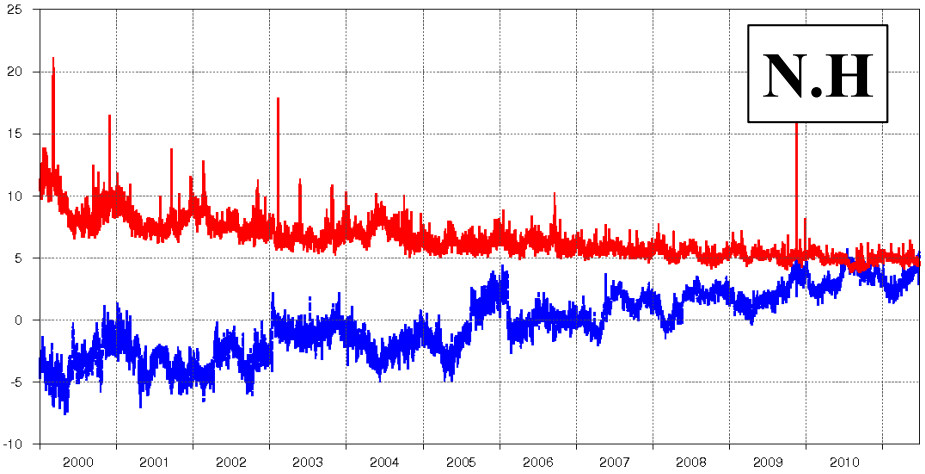
History Met Office – ECMWF analysis difference (Z500)

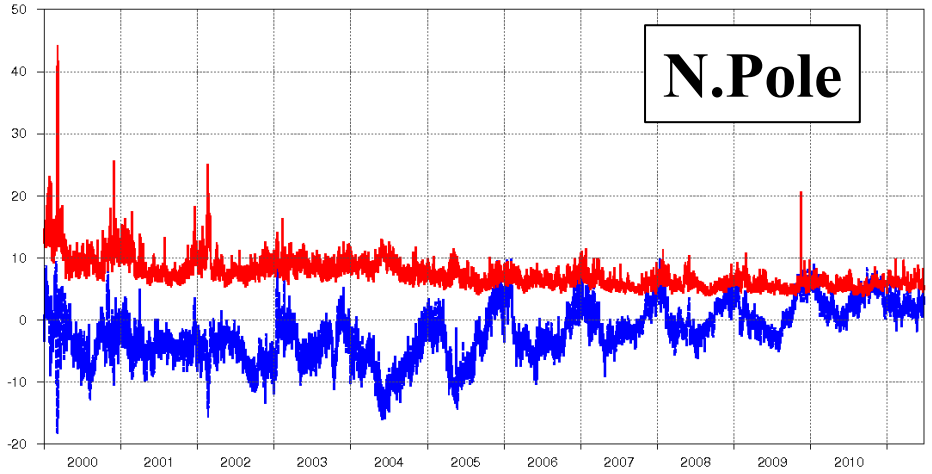
Thanks Martin Janousek

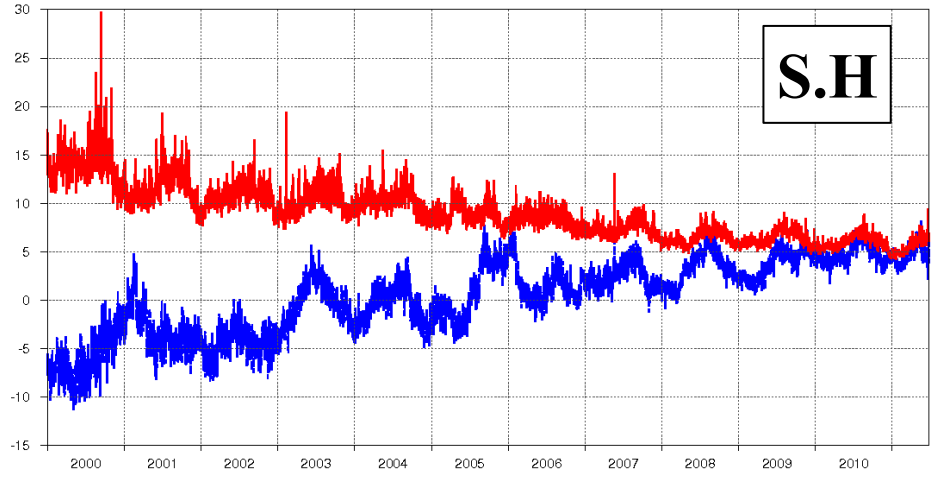
ECMWF

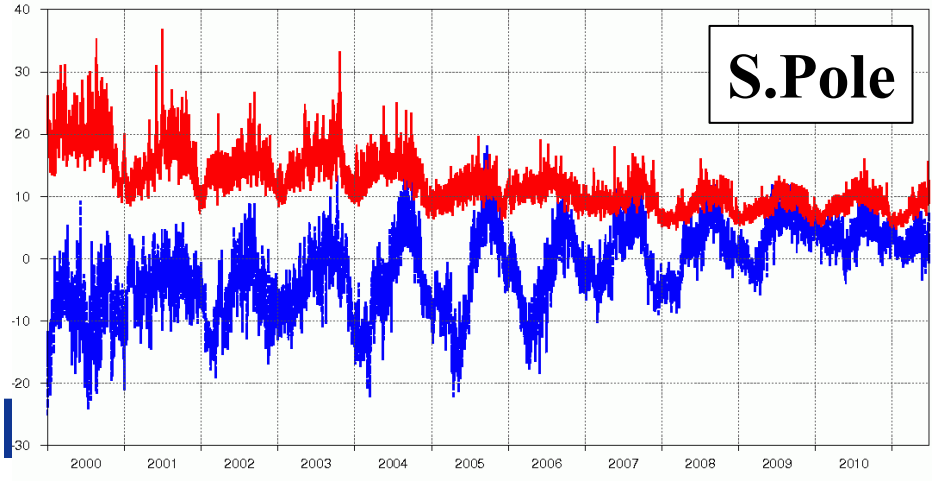
History Met Office – ECMWF analysis difference (Z500) BLUE=mean RED=sdev

Martin Janousek





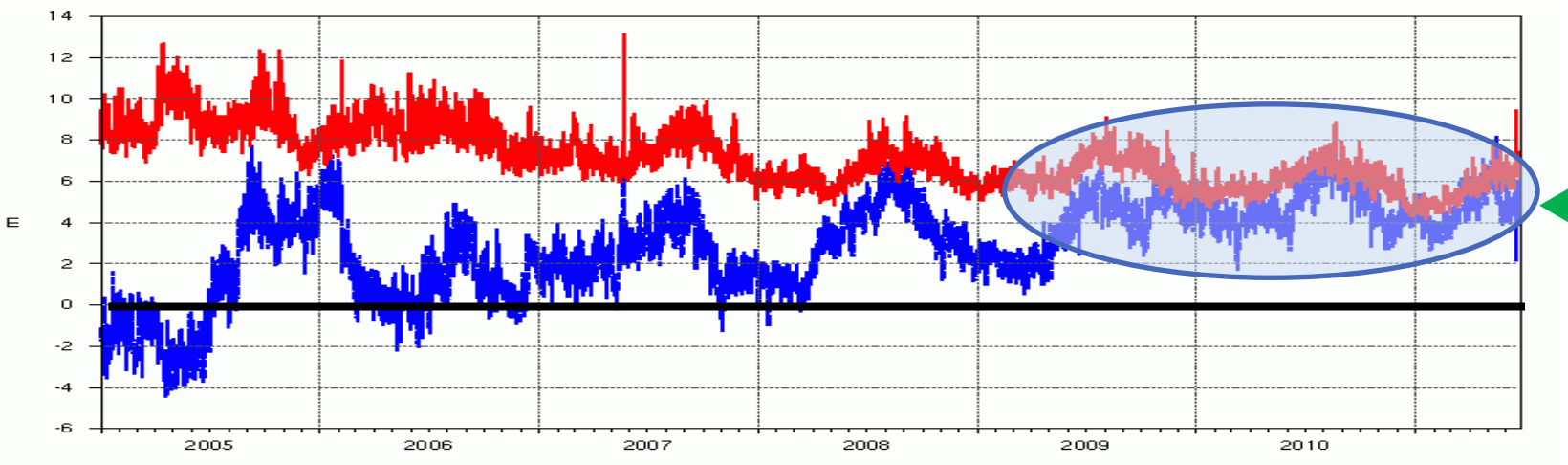




...who is right and who is wrong ...?

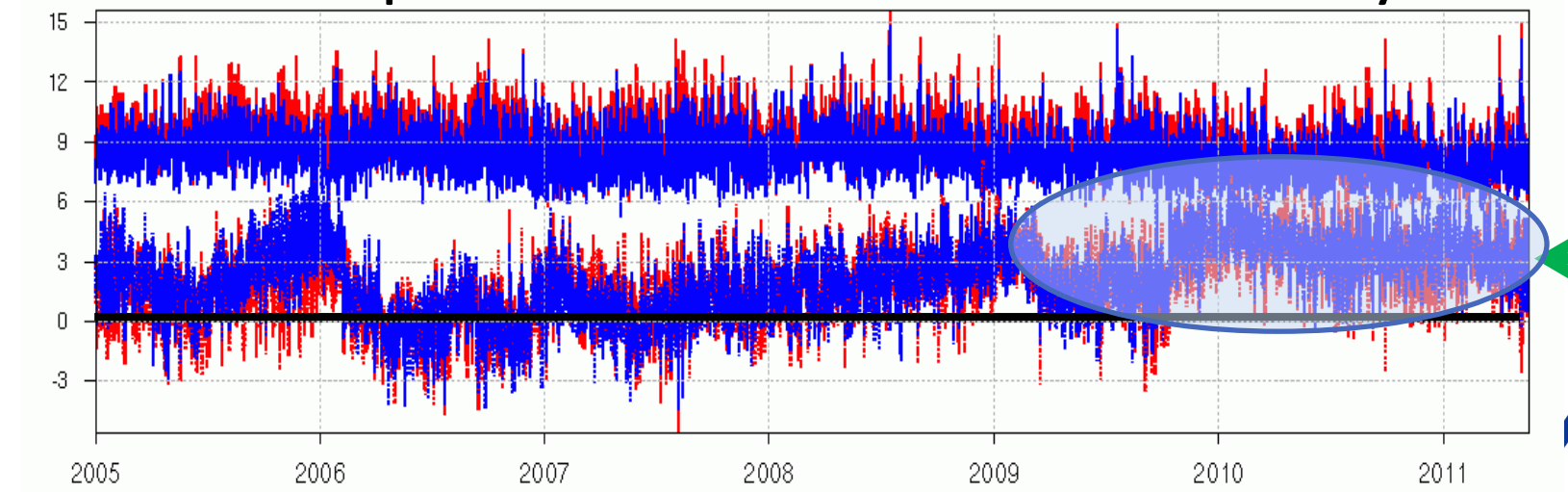
Comparison with TEMP observations

Southern Hemisphere Met Office minus ECMWF analysis Z500



5m cold bias

Southern Hemisphere TEMP observations minus ECMWF analysis Z500



3m cold bias

ECMWF

Alternative to own analyses

- **Different analyses**
  - They have also but different biases
- **Multi-analyses**
  - Mean
  - Randomly picked
- **Observations**
  - Representativeness
  - Data coverage (big advantage of using satellite data)
  - They are not perfect either

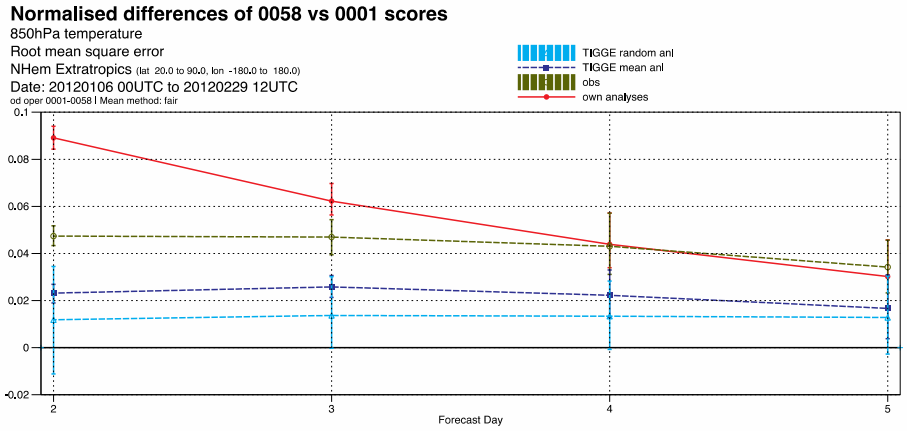
Sensitivity study:

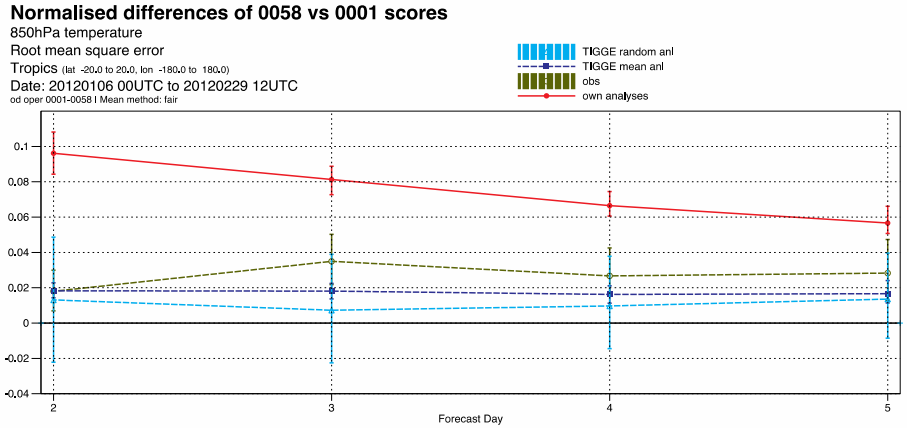
Comparison with various analyses:

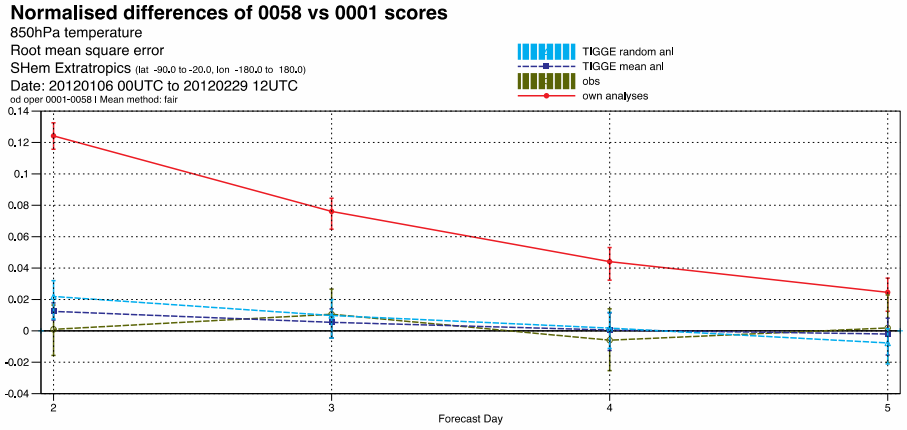
T-850 hpa

- own analysis: _____
- radiosonde observations: --------
- TIGGE mean of UKMO, NCEP, CMC and JMA analyses: --------
- TIGGE random pick from UKMO, NCEP, CMC and JMA analyses: ----------

*: ECMWF deliberately excluded from verification database
**: “best” systems included







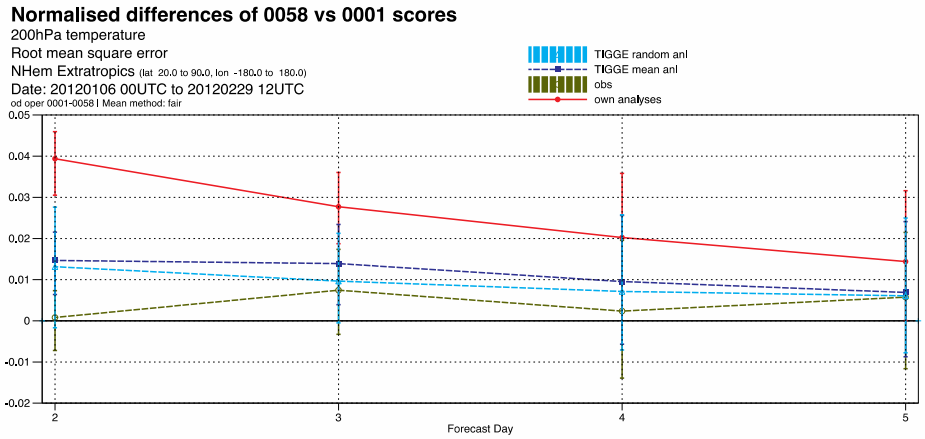
Sensitivity study:

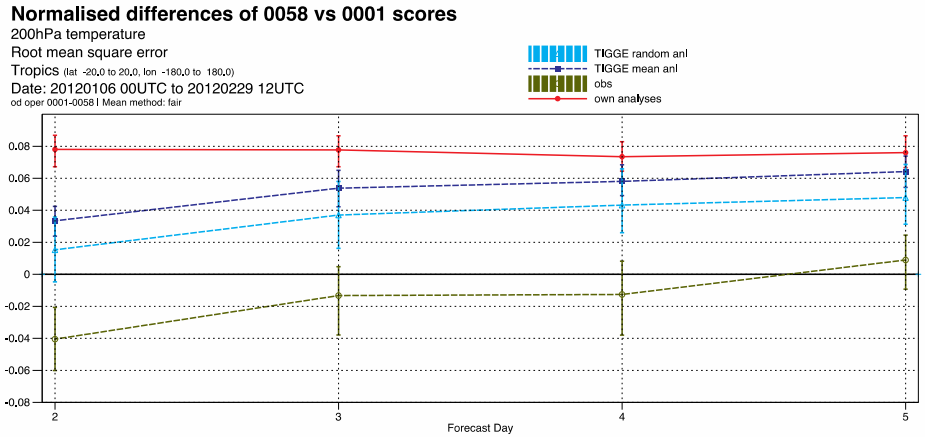
Comparison with various analyses:

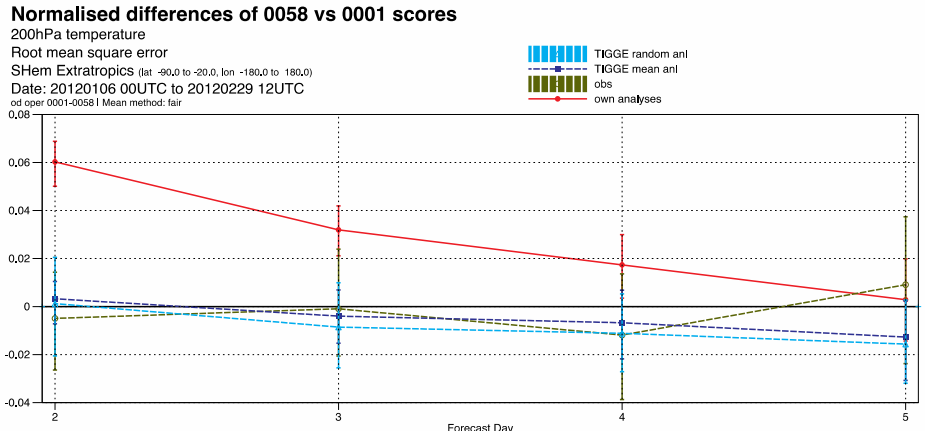
T-200 hpa

- own analysis: _____
- radiosonde observations: --------
- TIGGE mean of UKMO, NCEP, CMC and JMA analyses: --------
- TIGGE random pick from UKMO, NCEP, CMC and JMA analyses: ----------

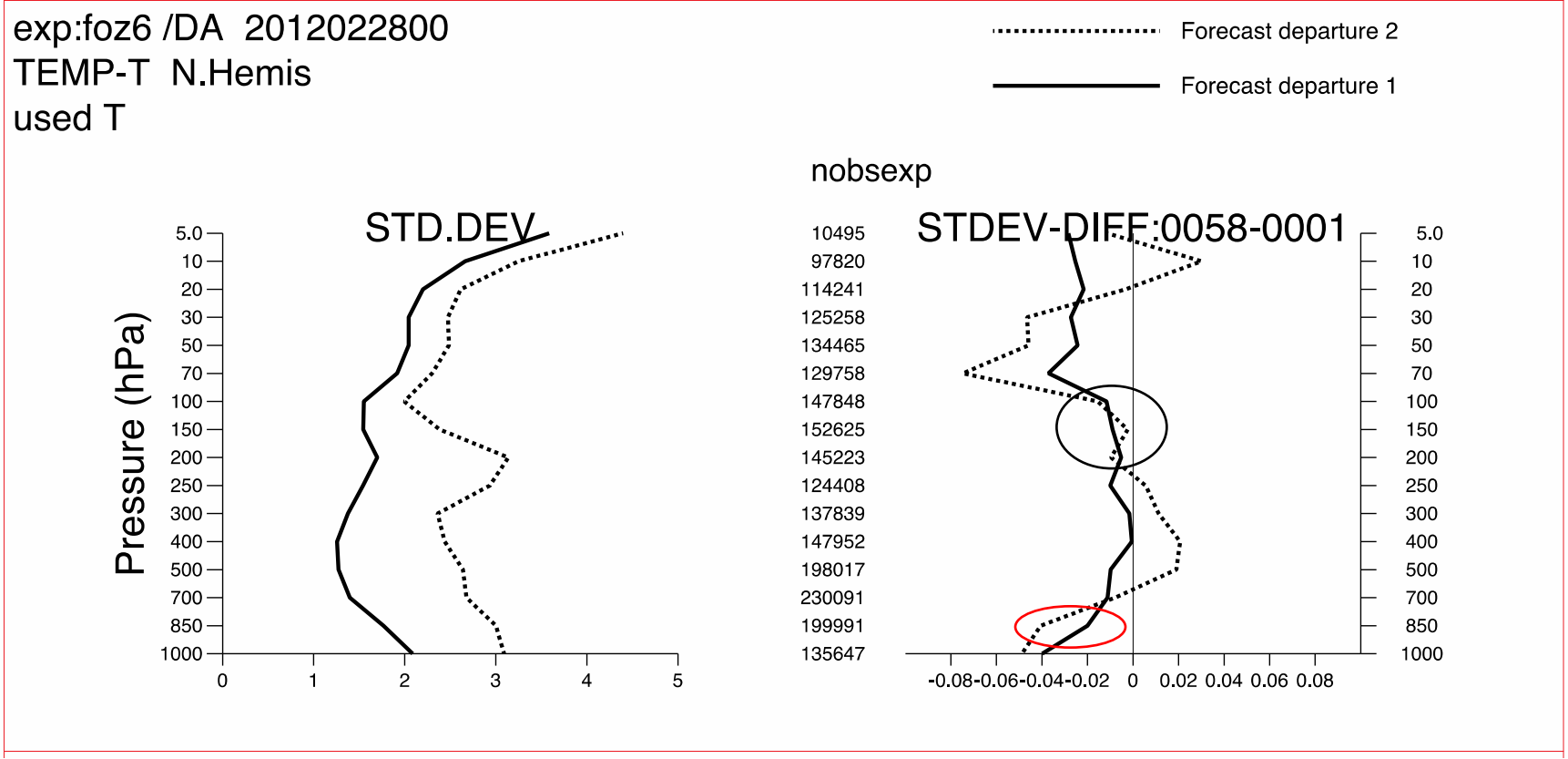
*: ECMWF deliberately excluded from verification database
**: “best” systems included







Another way of verifying: processing the forecasts through our assimilation suite



Confirmation of previous scores

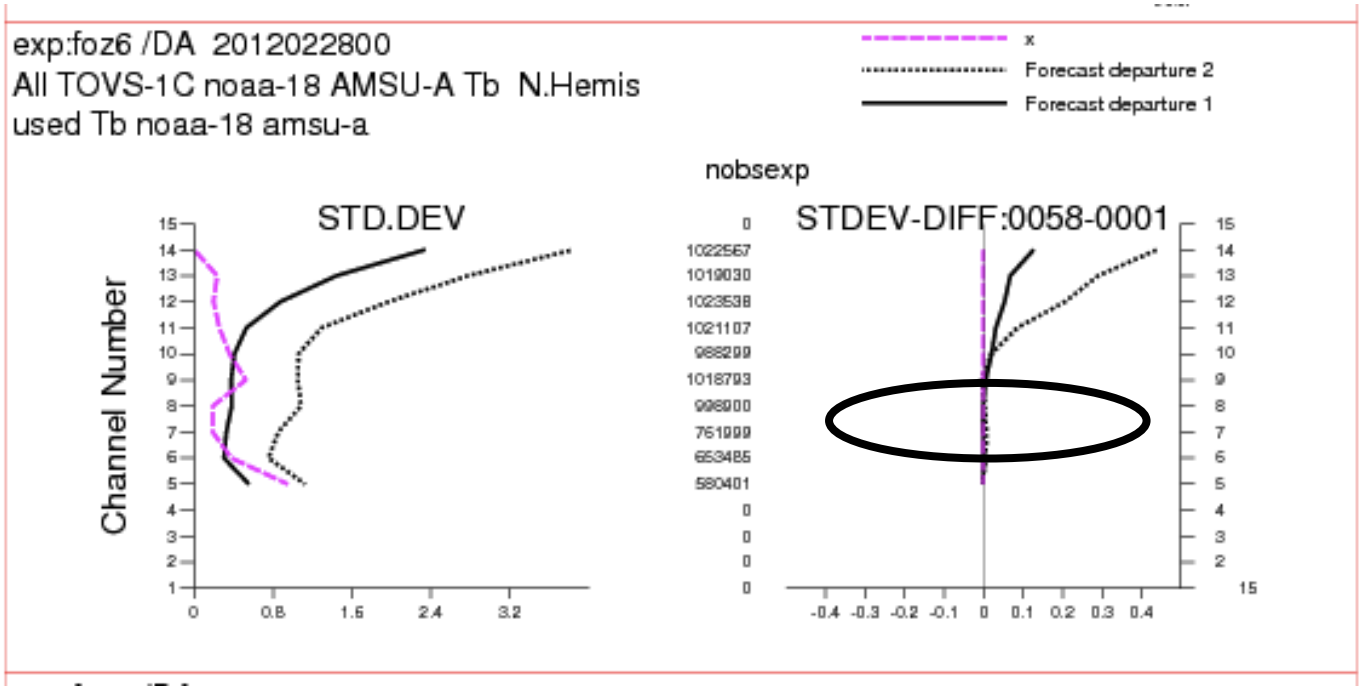
First issue: bias correction of observations

Second issue: R/S data coverage

Work in progress: direct comparison of model forecast with satellite observations

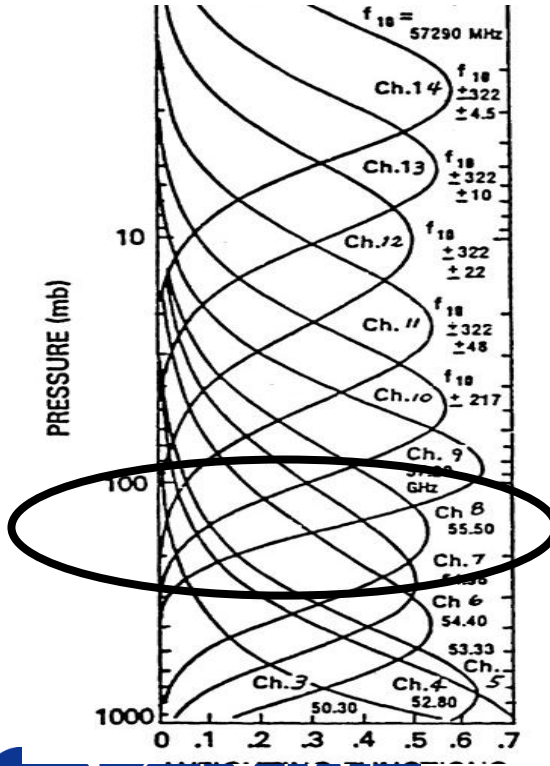
- Pros:
  - full data coverage (as good as analyses)
- Cons:
  - Representativeness and interpretation

Two examples (1): AMSU-A

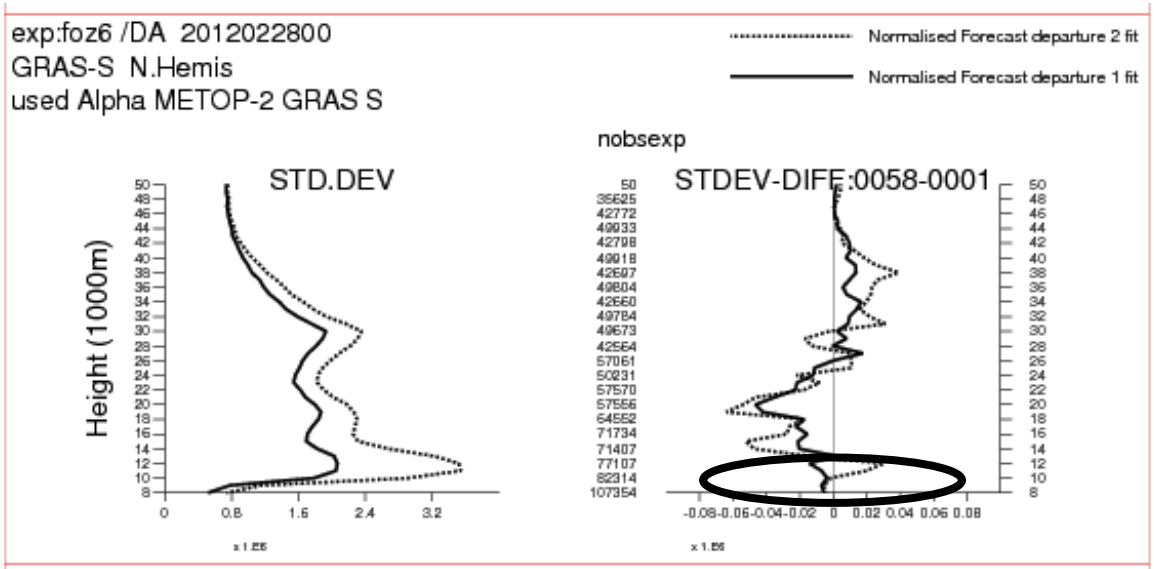


Northern Hemis.

Brightness temperatures

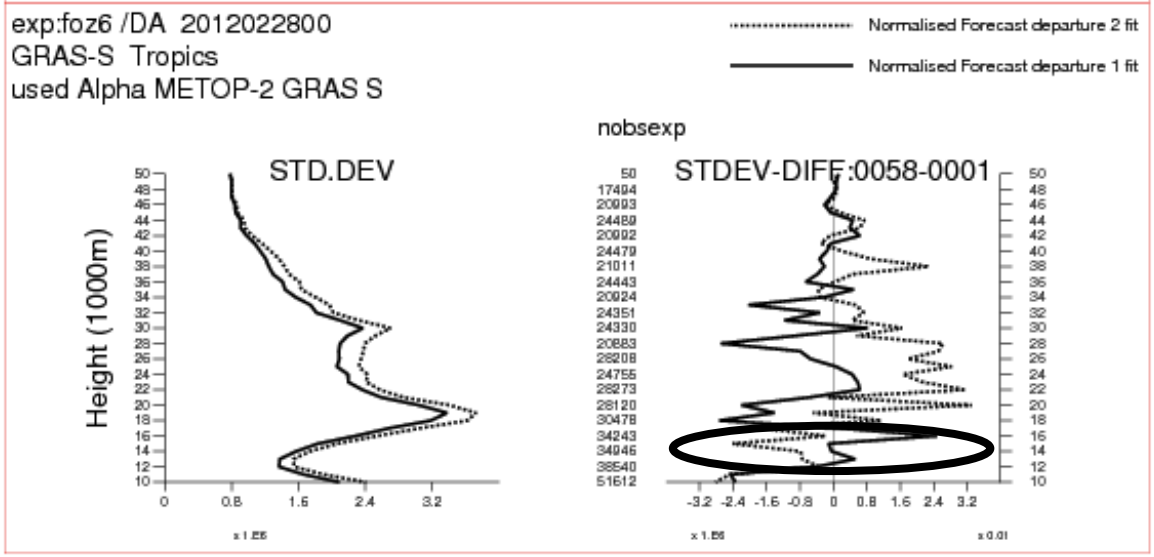


Two examples (2): GPSRO (unbiased dataset)



Northern Hemis.

Bending angles



Tropics

conclusions

- **Very much work in progress**
- **Investigate further the relevance of the TIGGE resource internally**
- **Promote a more systematic comparison in observation space**
  - **Possibly requires an additional level of abstraction**
  - **Satellite data verification can be cross-checked with more standard R/S verification**

Thank You