Temperature verification

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Verification questions

1. Are the model output statistics (MOS) forecasts superior to the Direct Model (DM) output?

2. Is there any impact of the elevation on the quality of the forecast?

3. Performance with the lead time?

4. Difference between the forecasts in day time / night time?

- 4 meteorological stations from Romania

Cluj-Napoca
15120 – 410 m

Craiova
15200 – 116.6 m

Bucharest
15420 – 90 m

Arad
15450 – 192 m

Data used:

The data contains 2 m temperature for 00, 06, 12, 18 UTC, for 3 months (June-August 2006)
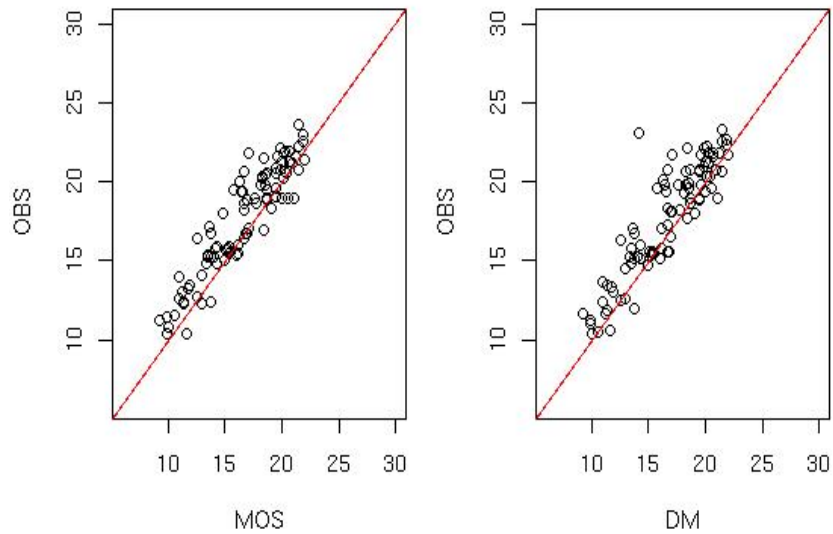
- <u>Forecast</u>:

     - Ecmwf - Direct Model

     - Ecmwf - MOS

- <u>Observations</u> – from the same SYNOP meteorological stations

Data quality Issue

- Initial result:
  - There is always a positive bias in all lead time
  - But looking at the data a bit deeper it's not because the model systematic bias rather it is due to the forecast issue 0 forecast (which might be a missing value or some kind of data problem)
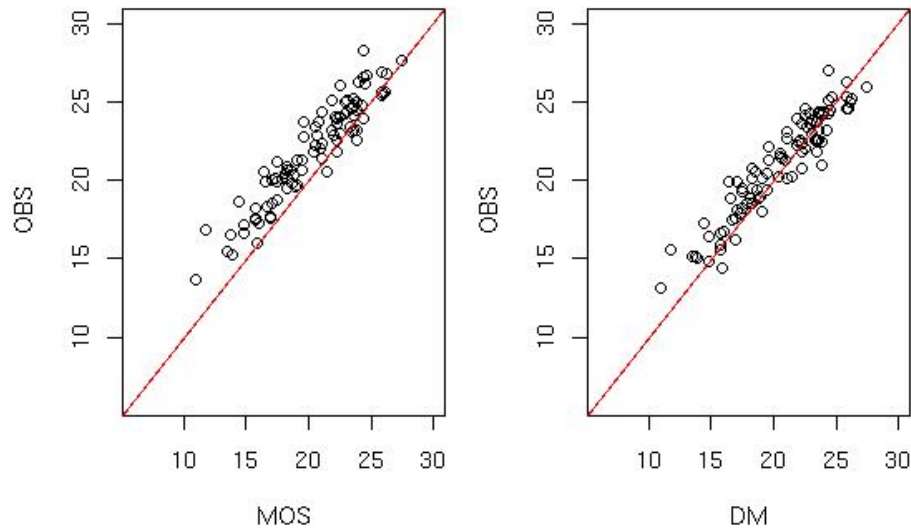- By removing the zeros from the forecast the bias decreases.
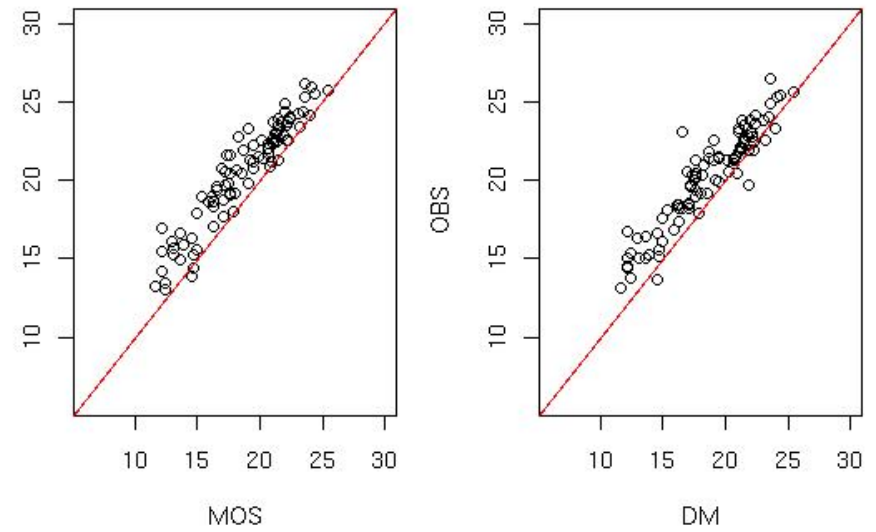
Station ID 15120 – 06 UTC lead 18H
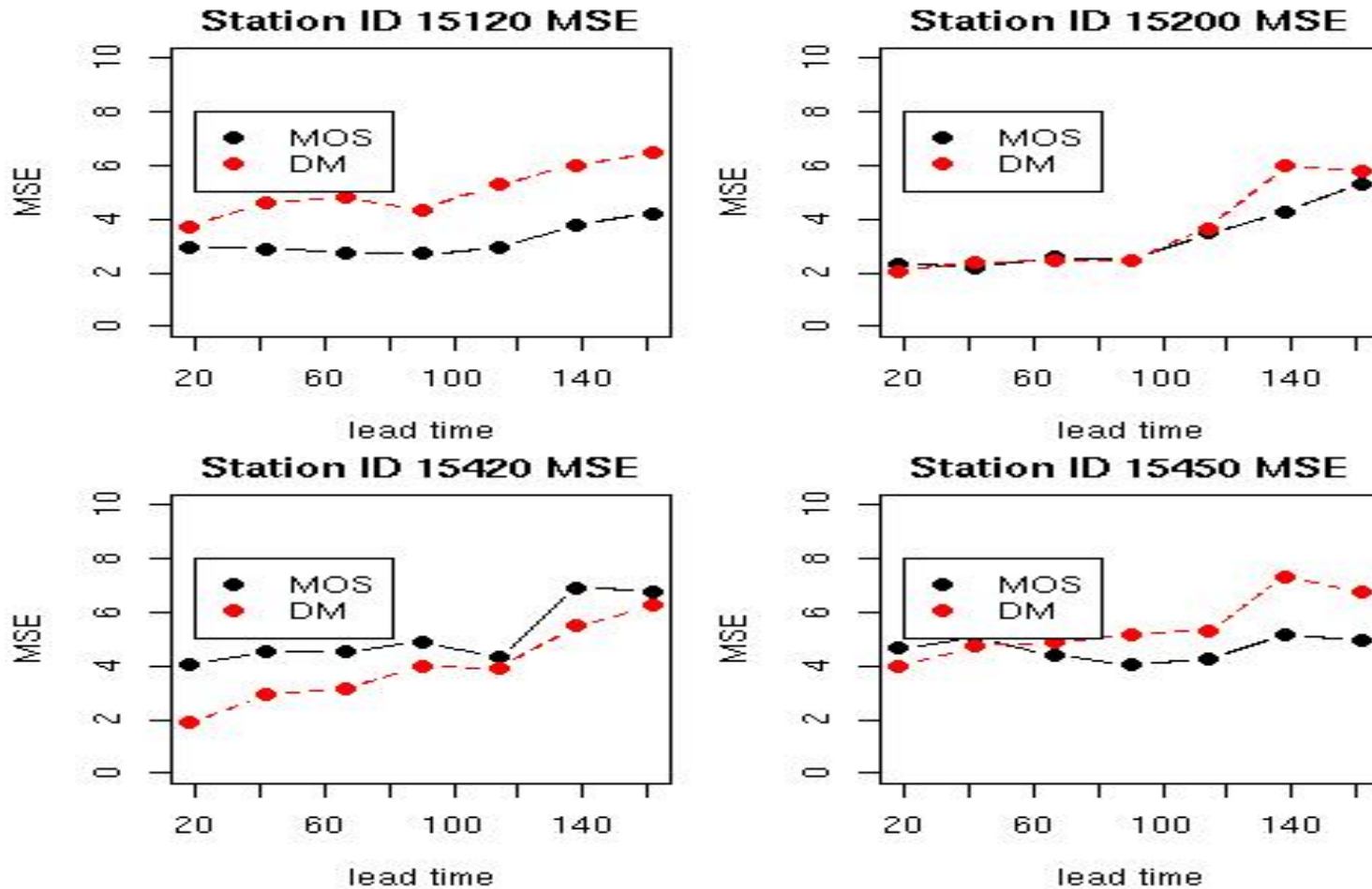

Station ID 15200 – 06 UTC lead 18H
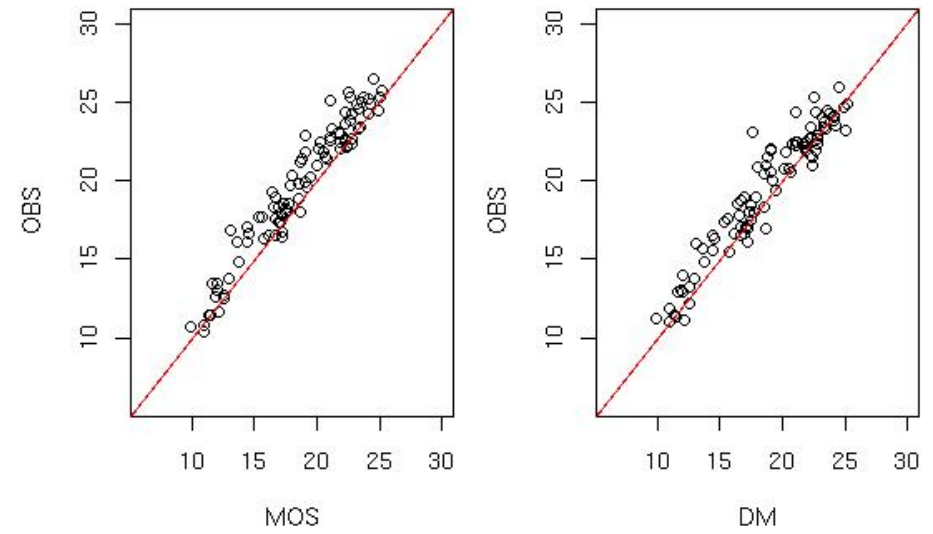
Station ID 15420 – 06 UTC lead 18H
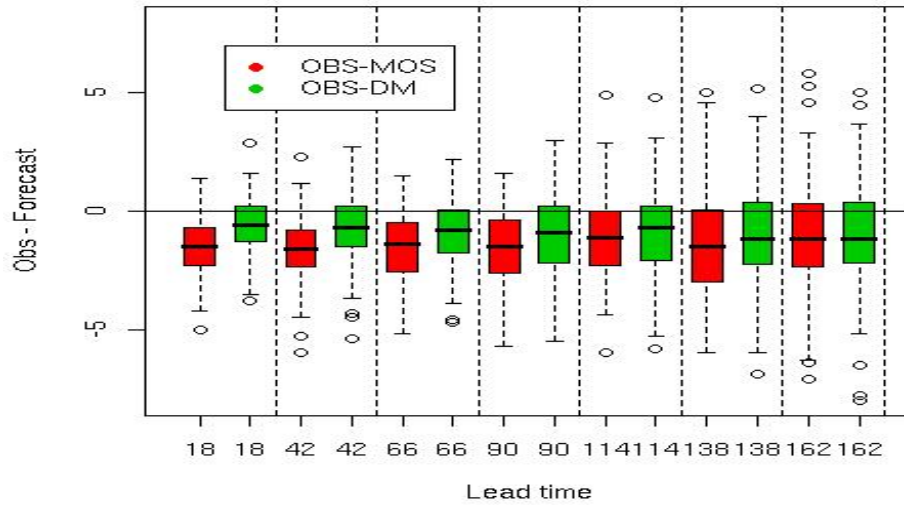

Station ID 15450 – 06 UTC lead 18H

MSE 18 UTC for each of the four stations
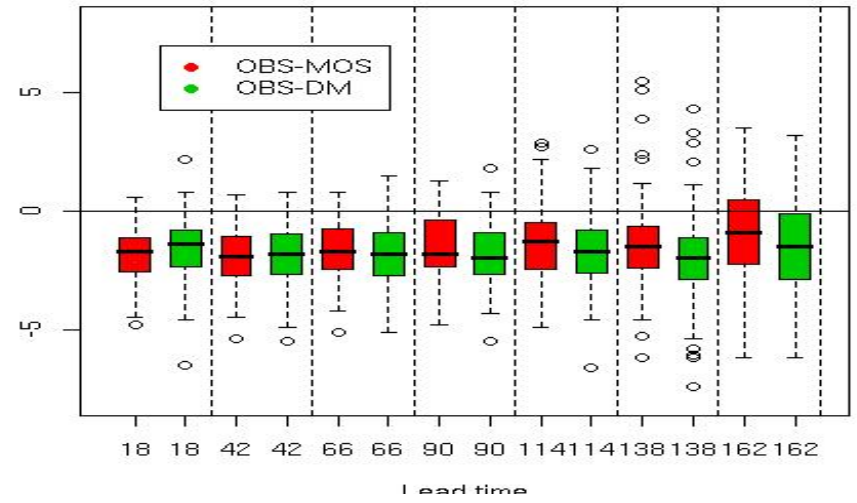## DM compared to MOS

•The error increases as the forecast lead time increases

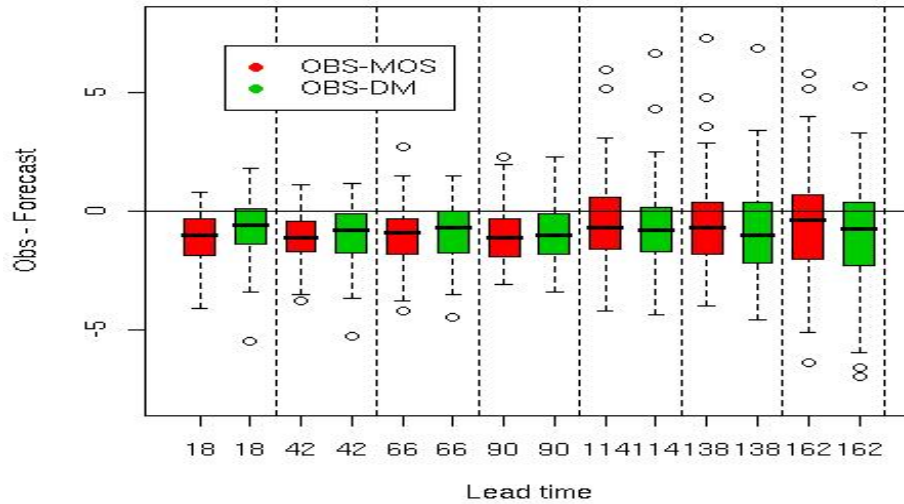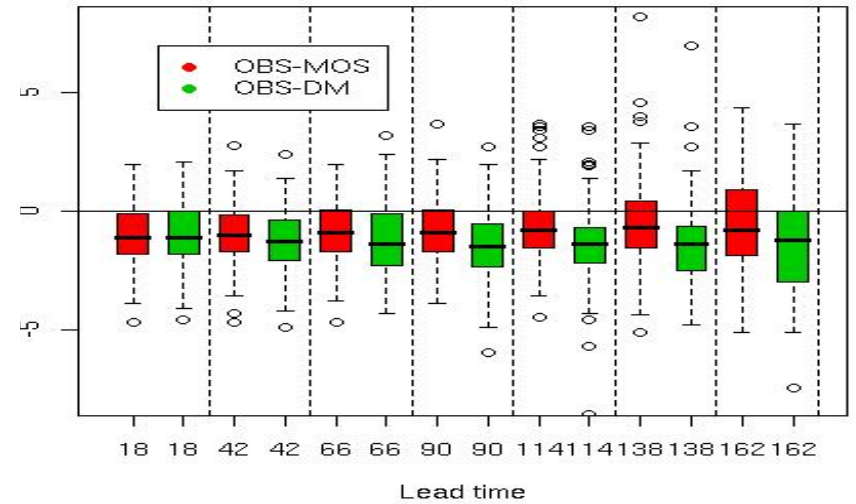# Boxplot for all stations for DM and Mos model 06 UTC

Station ID 15420

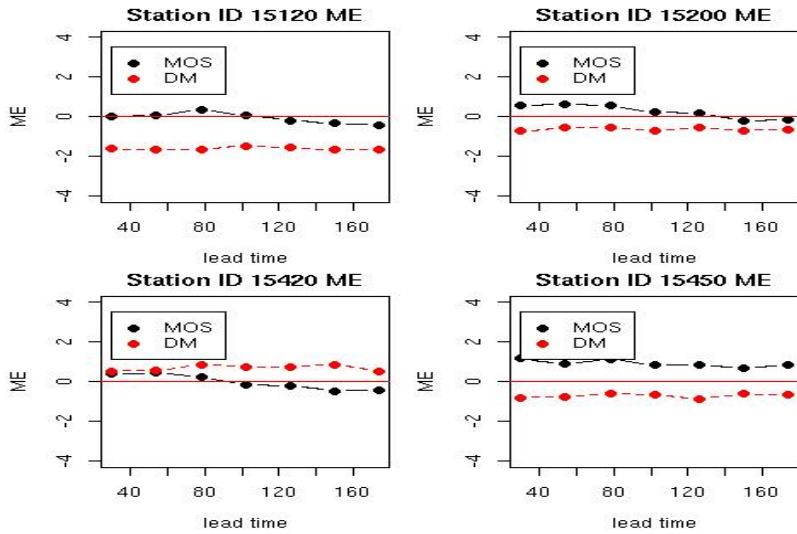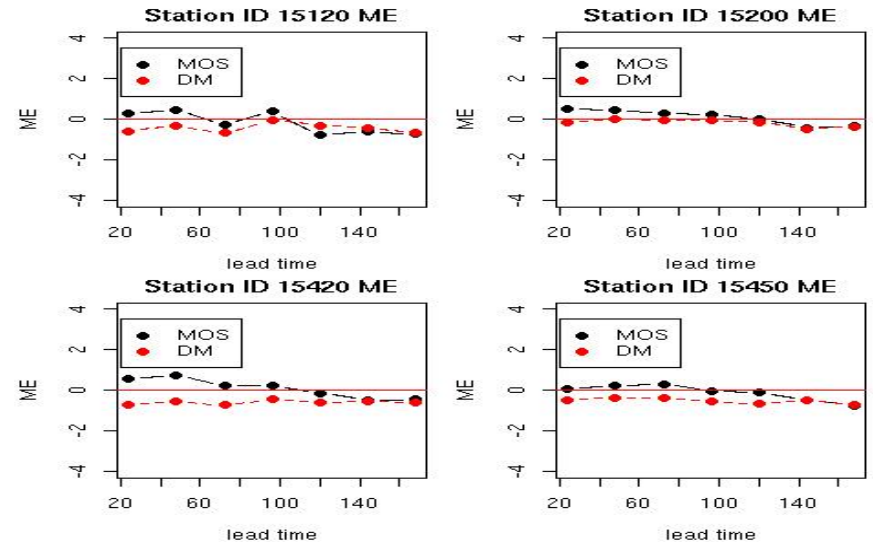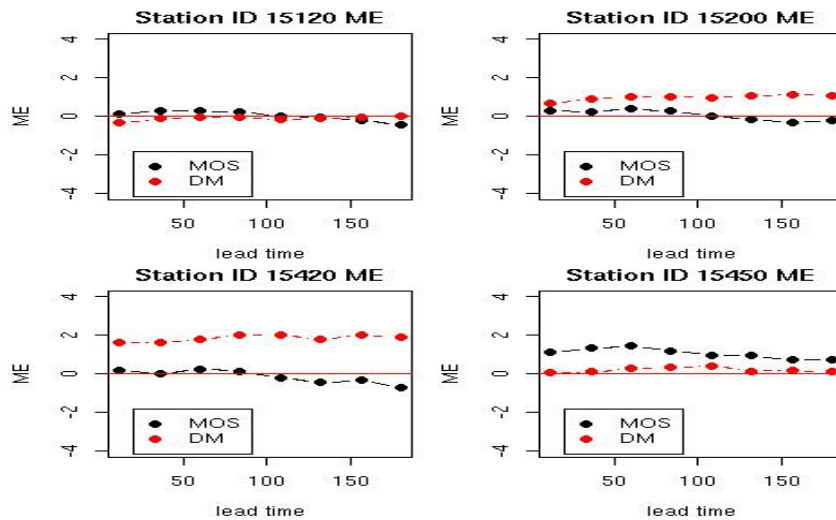Station ID 15450
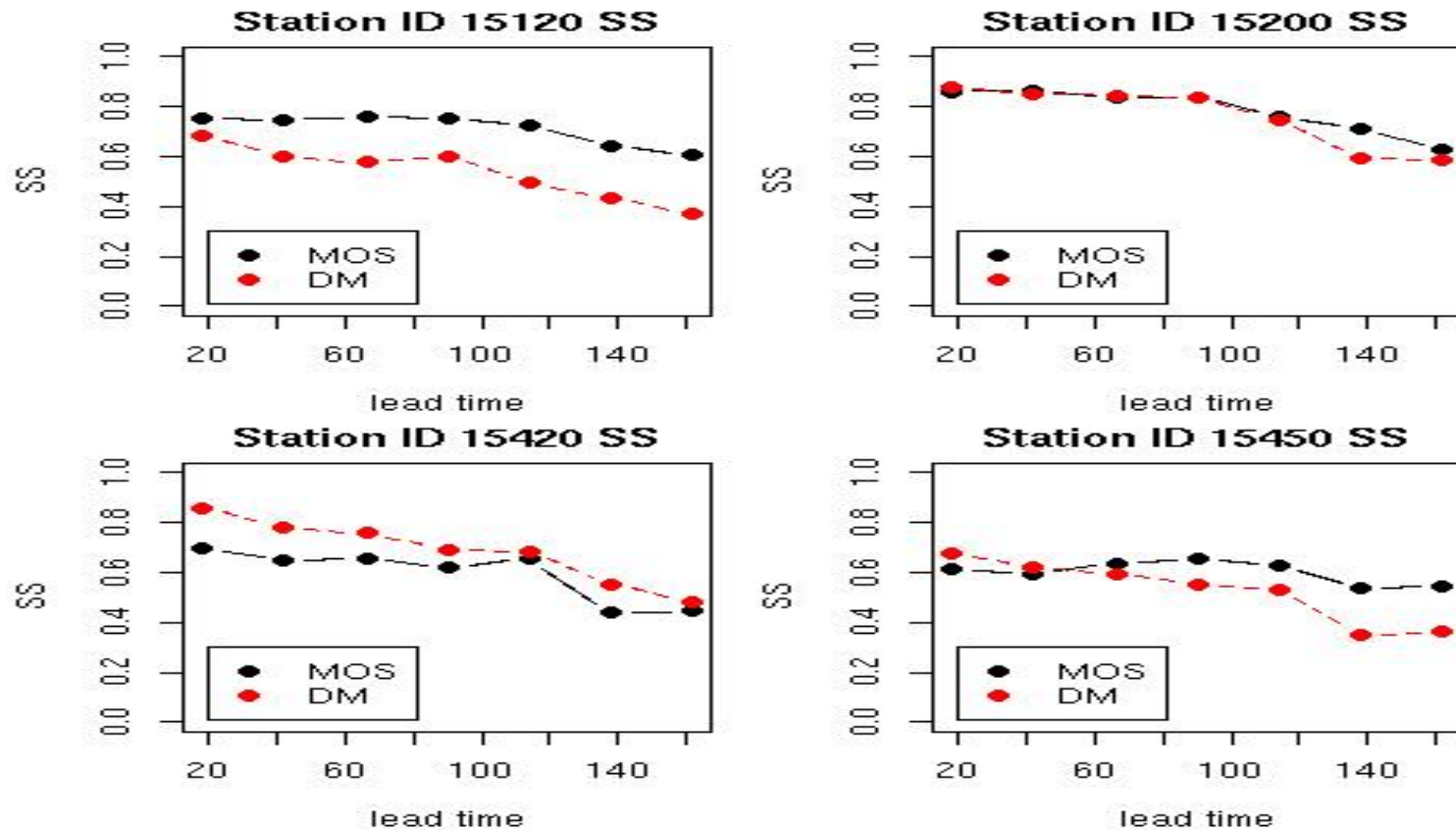

Station ID 15200

Station ID 15120

18 UTC

12 UTC

00 UTC

- DM has a large bias 00 UTC for Bucharest.(15420)
- MOS has in general smaller bias
- 15120(highest altitude) shows a higher bias for 18 UTC DM compared to other times.

MSE Skill score compared to climatology

At all lead time both forecasts are accurate compared to climatology

Summary and conclusions

- In most cases MOS is better than DM output especially for high altitude
- The error and spread increases as the lead time increases
- The MSE skill is better than climatology at all lead times