Spatiotemporal data analysis of precipitation in Brest’s territory

Application to urban hydrology

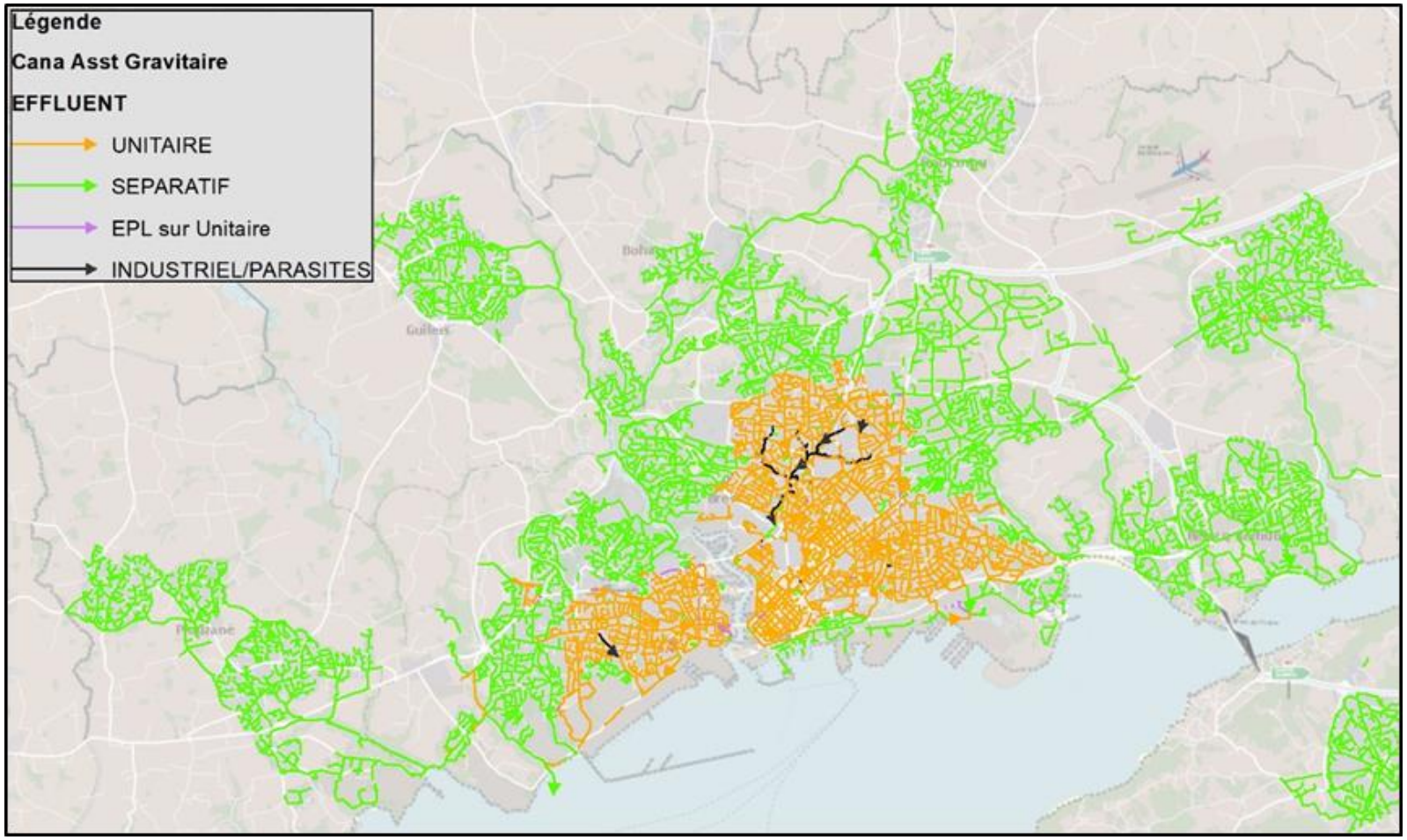
Sewerage systems designing methodology

Separated = waste water

Combined = waste + storm water

Strong precipitations

→ **dumping**



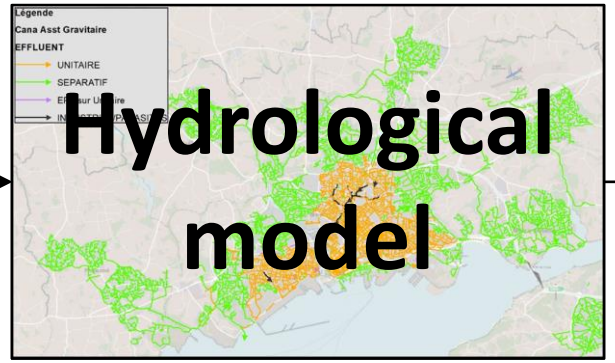
INTRODUCTION

Goal:

Designing systems to manage waste water dumping into the environment

FORCINGS

- Precipitation
- Waste water
- Evapotranspiration



OUTPUT

Dumping

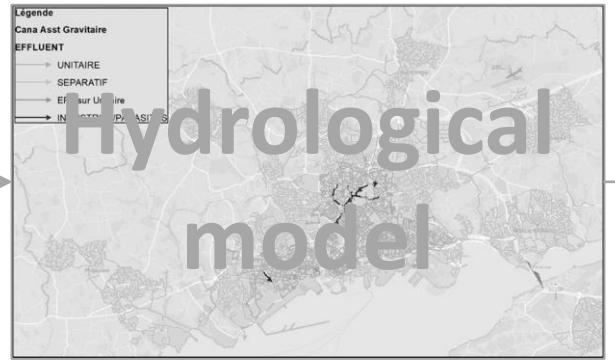
INTRODUCTION

Goal:

Designing systems to manage waste water dumping into the environment

FORCINGS

- Precipitation
- Waste water
- Evapotranspiration



OUTPUT

Dumping

Data sources

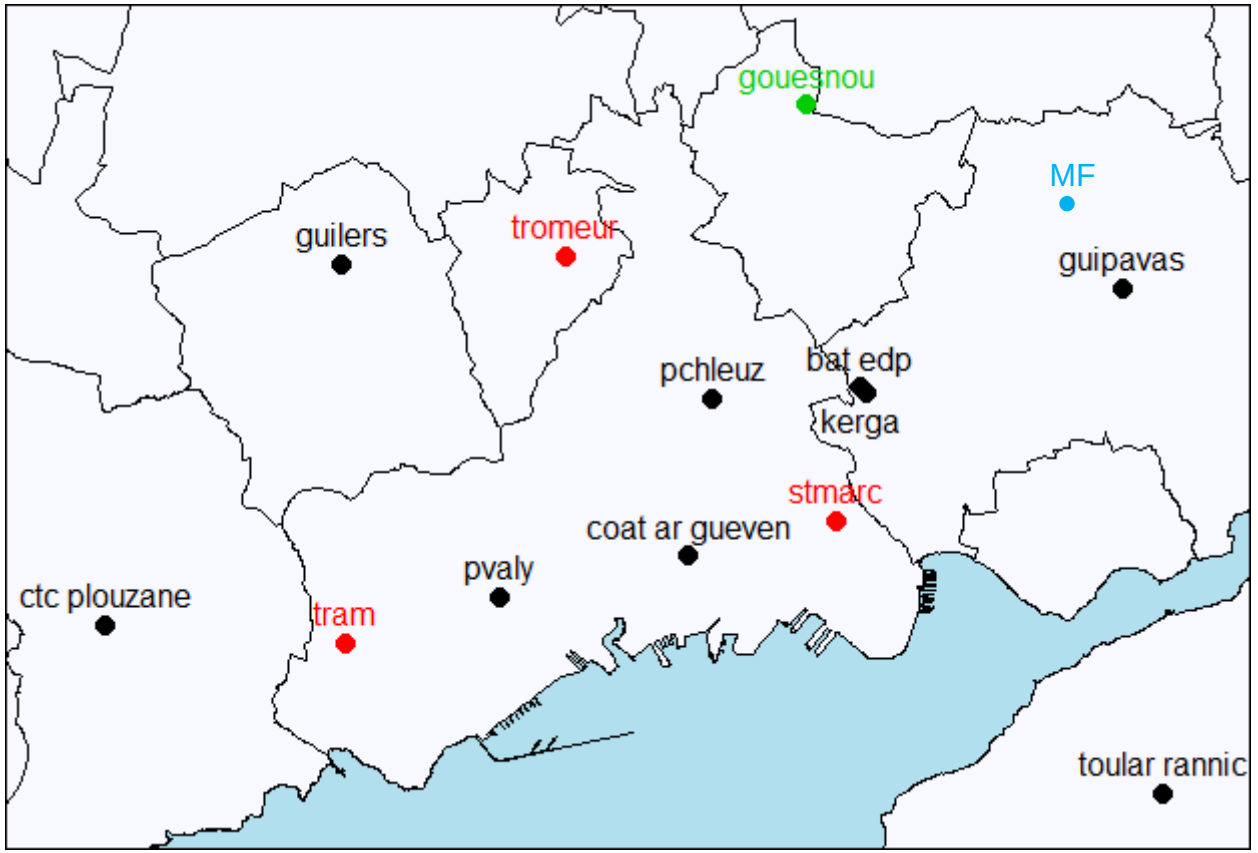
1) Eau du Ponant : 10 gauges

2) Météo France : 1 gauge, radar images

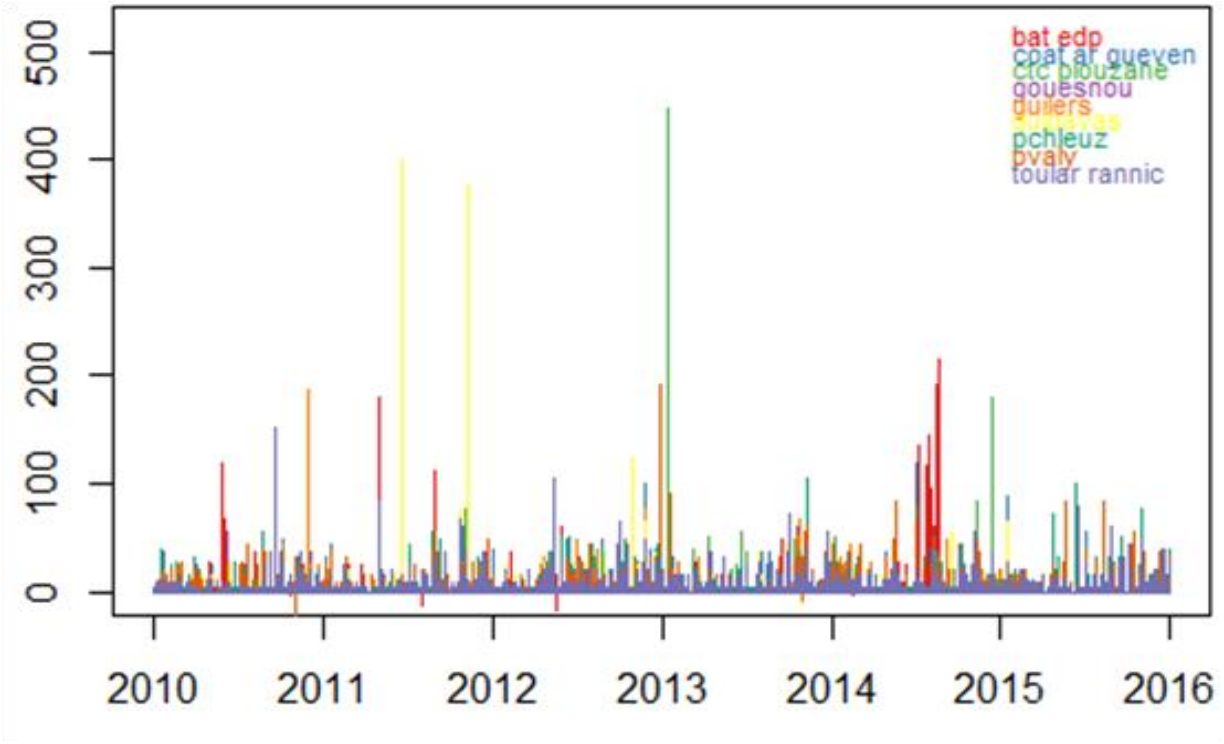
DATA

EAU DU PONANT

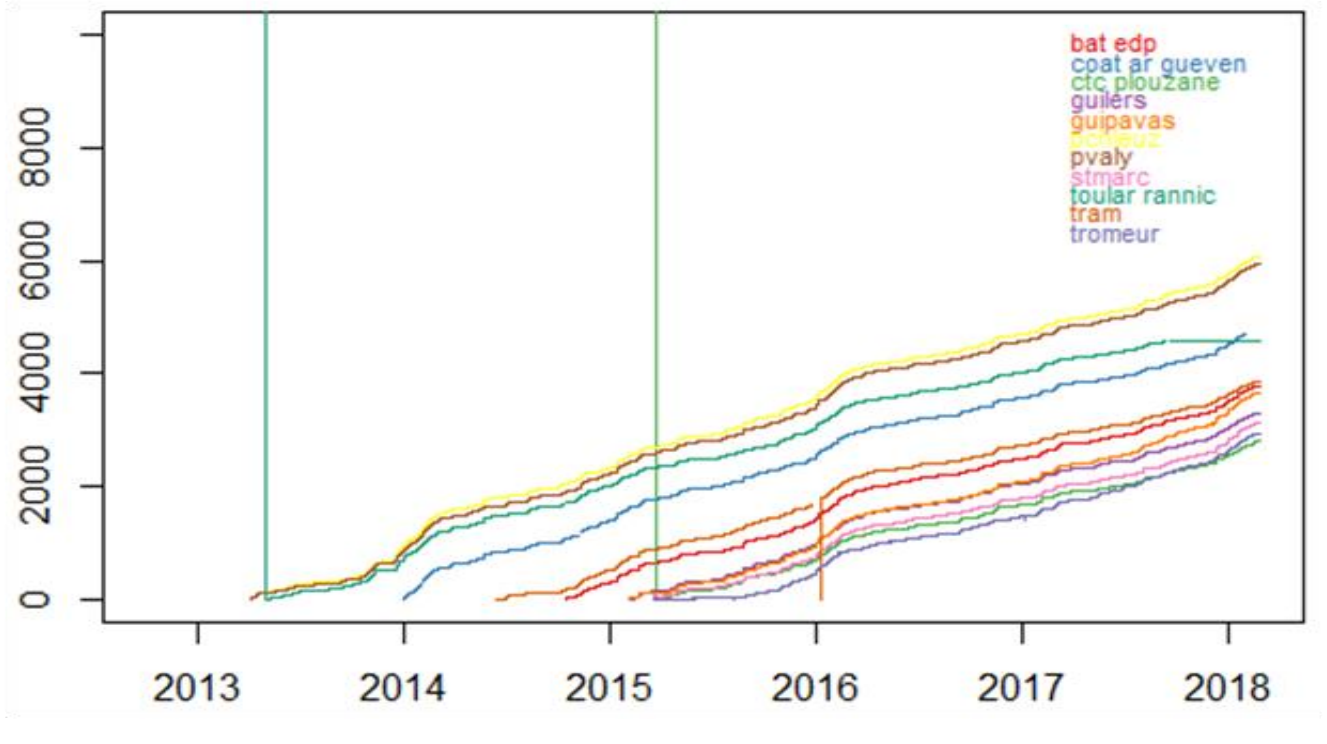
11 gauges
0.2 mm
3 minutes



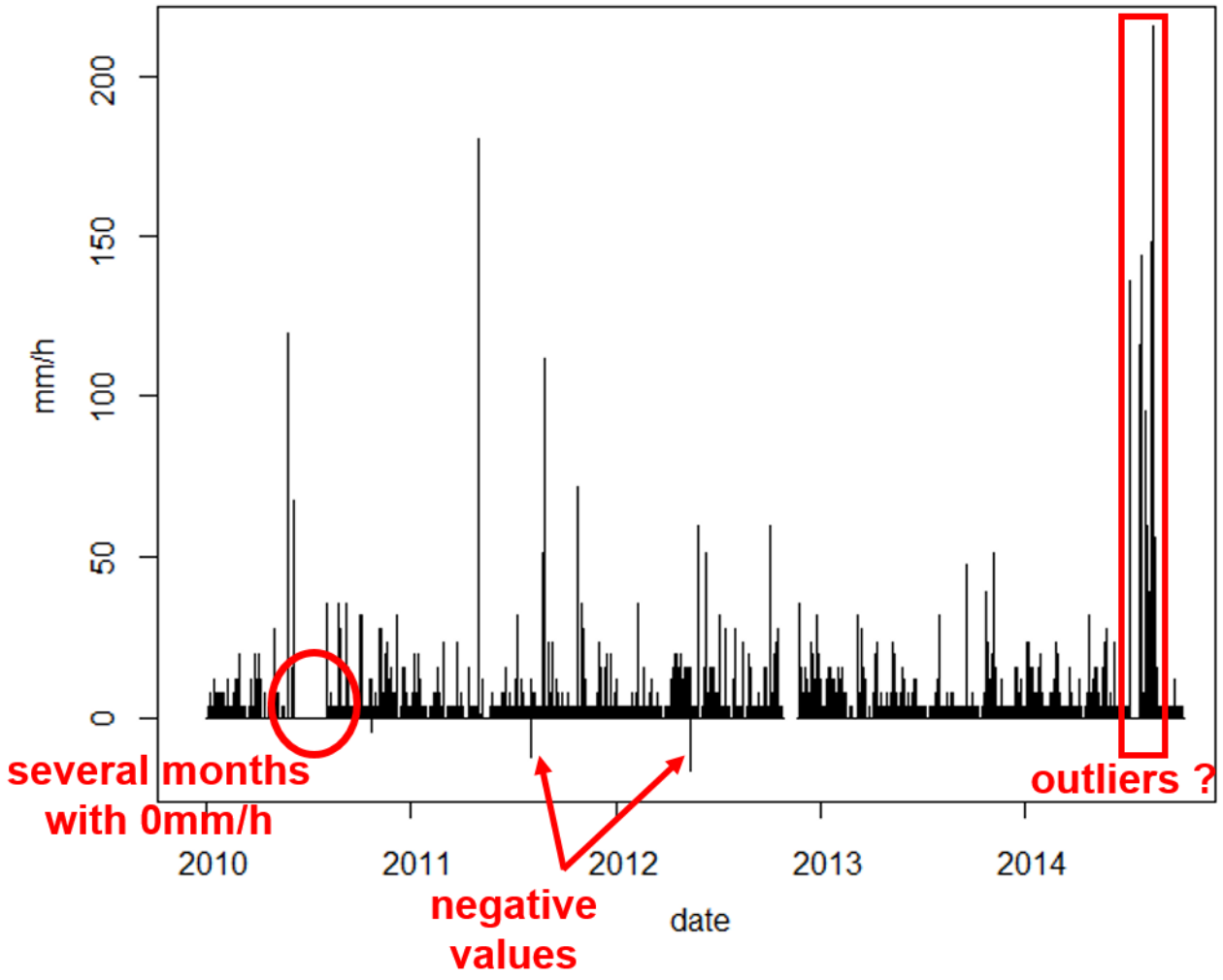
<2014 : manual correction



>2014 : raw data

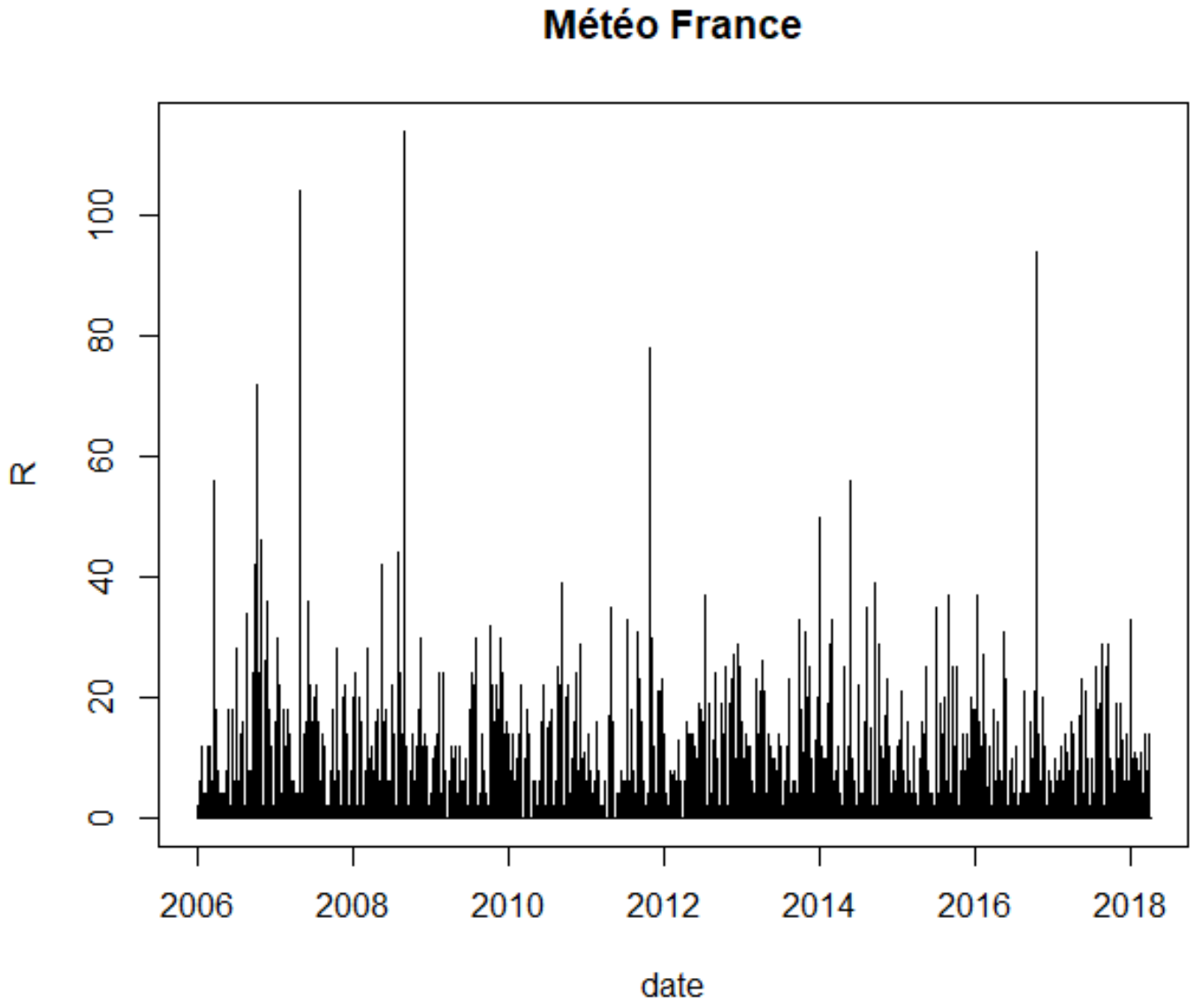


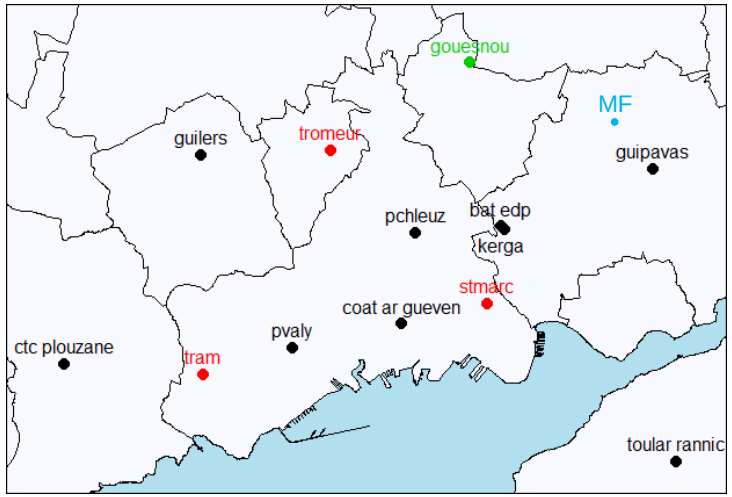
Can we trust the data?



METEO FRANCE

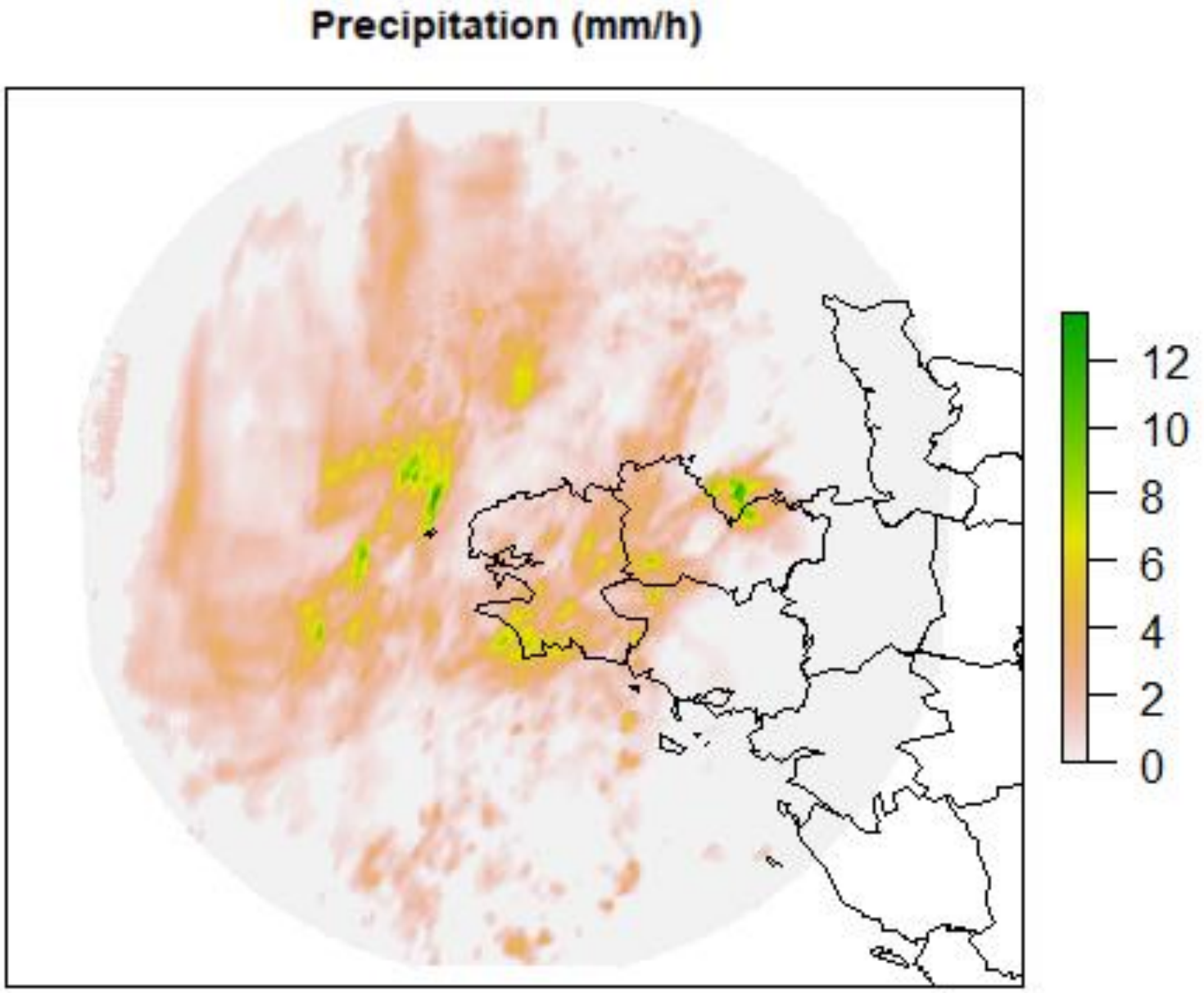
1 gauge
0.2 mm
6 minutes



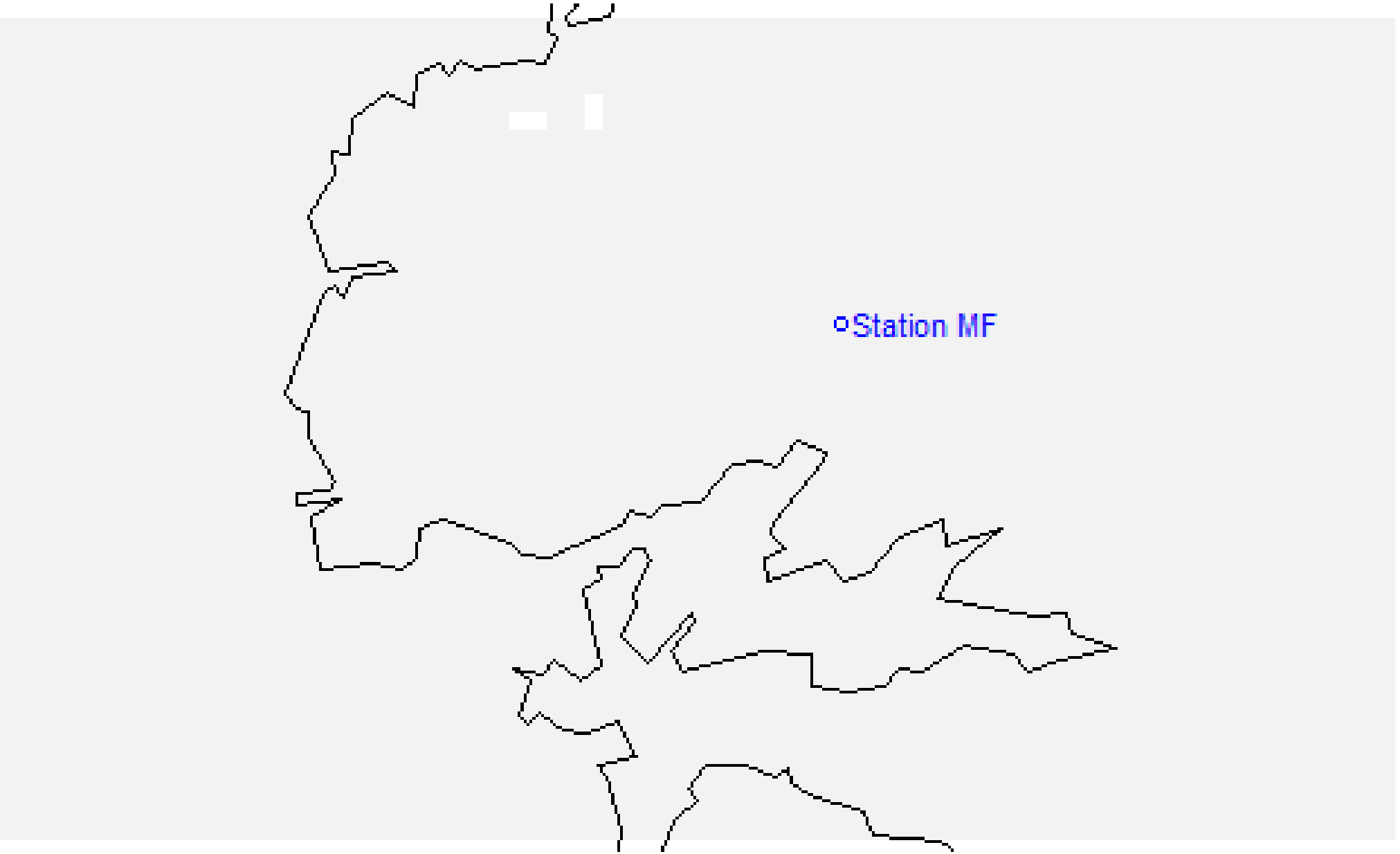


RADAR

5 minutes

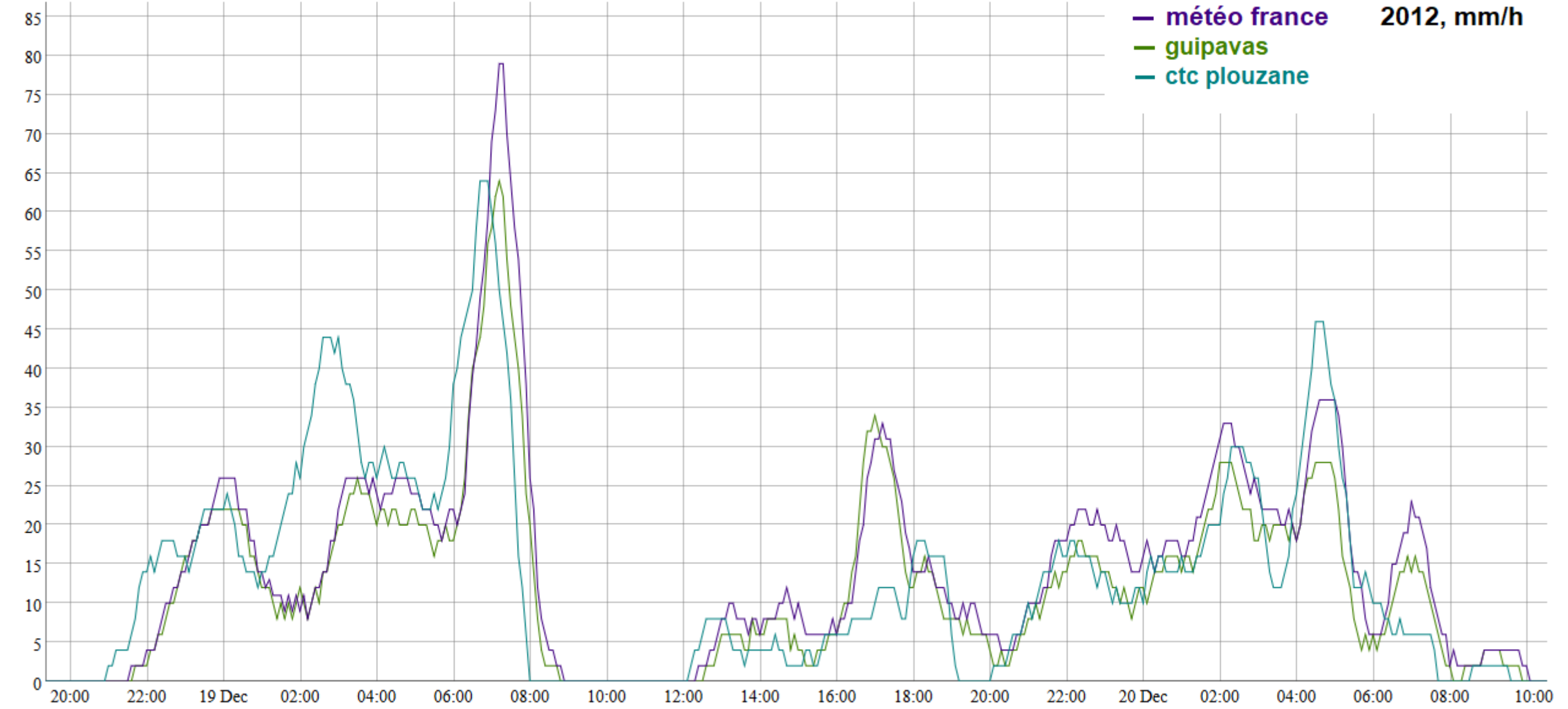


RADAR



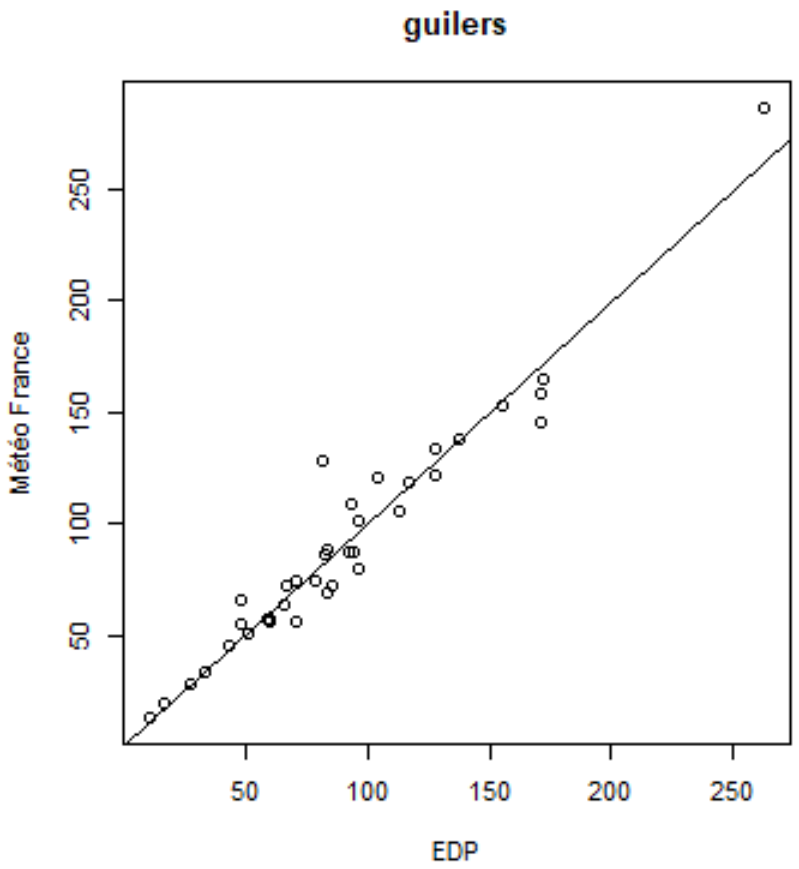
COMPARING GAUGES

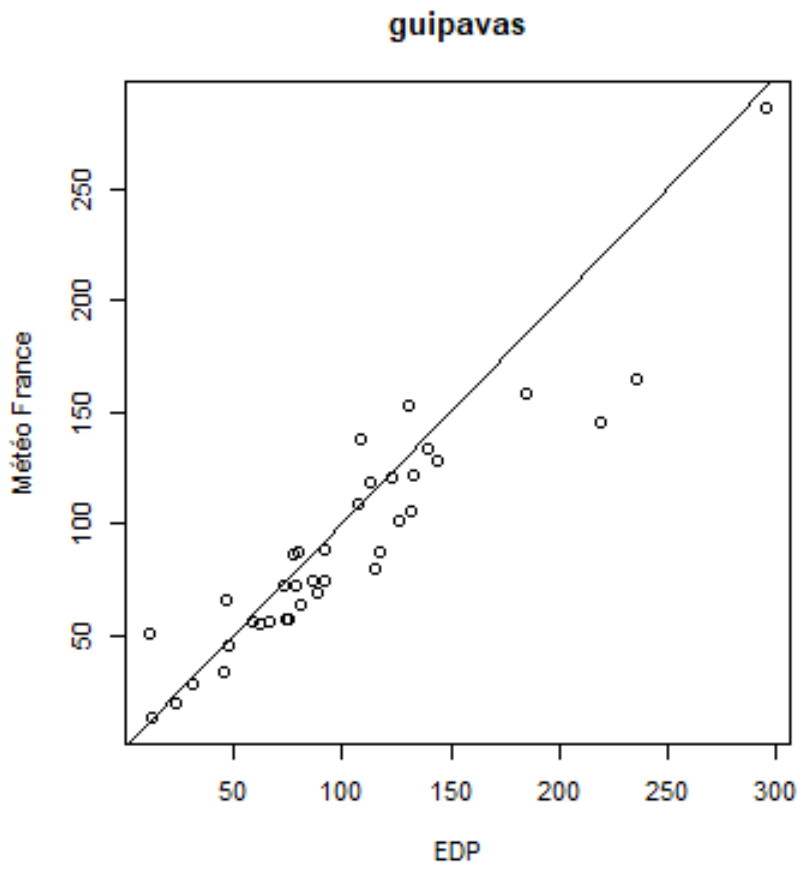
GENERAL AGREEMENT

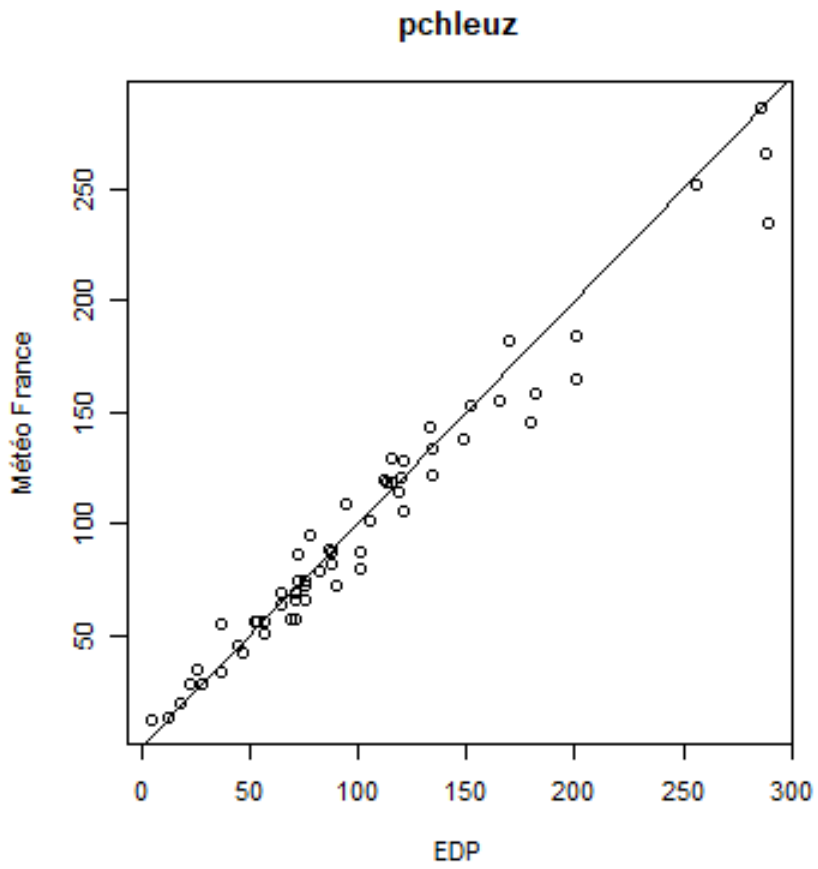


(30' moving average)

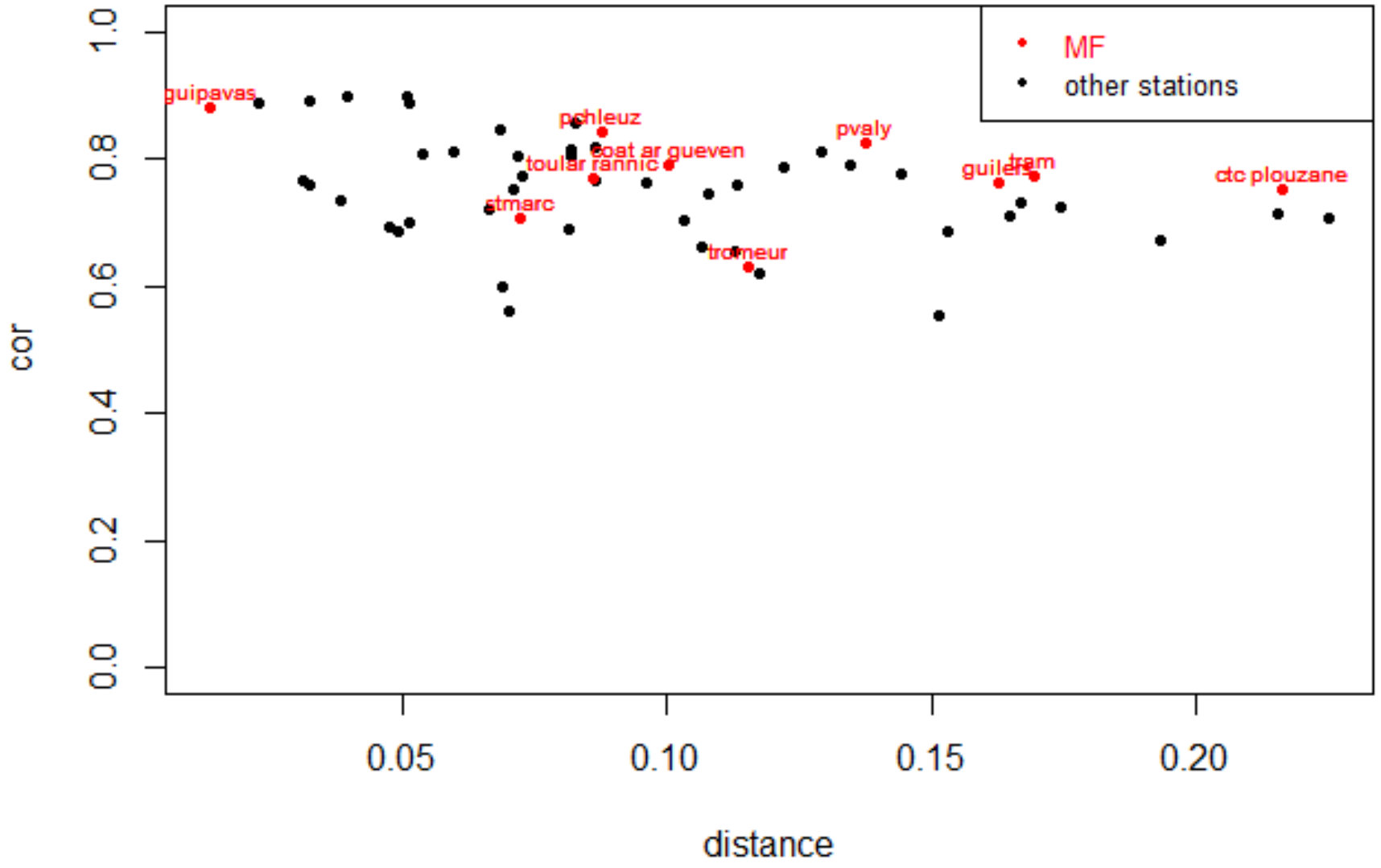
GENERAL AGREEMENT





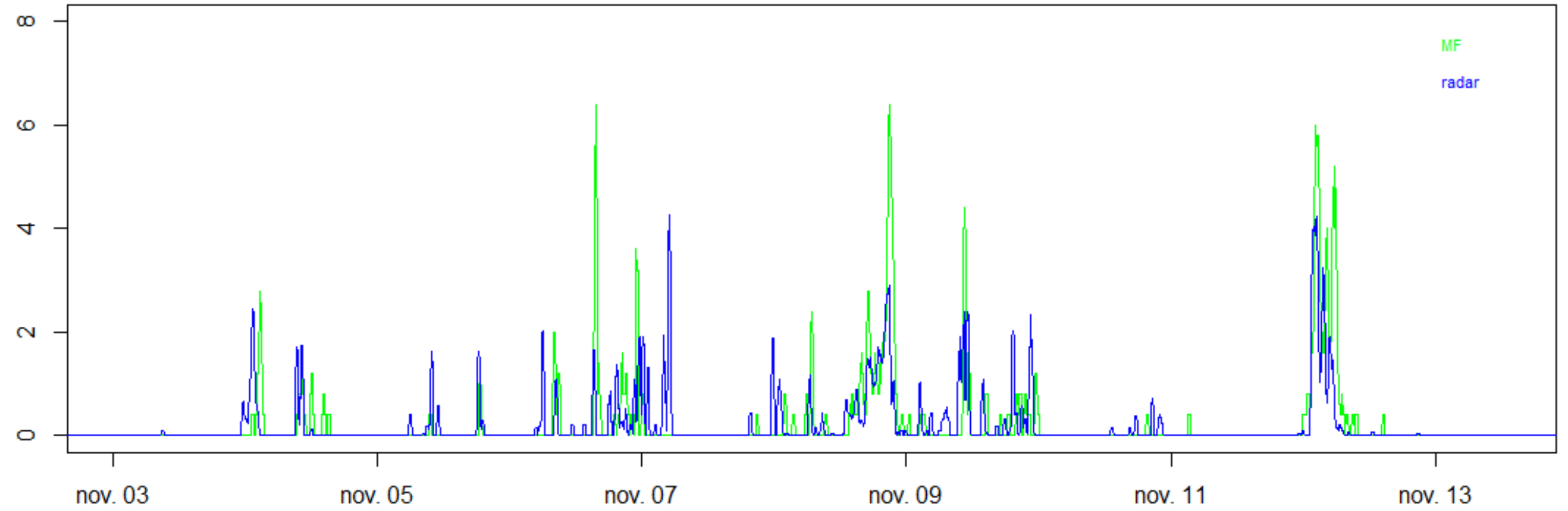


Correlation on 1 hour moving average

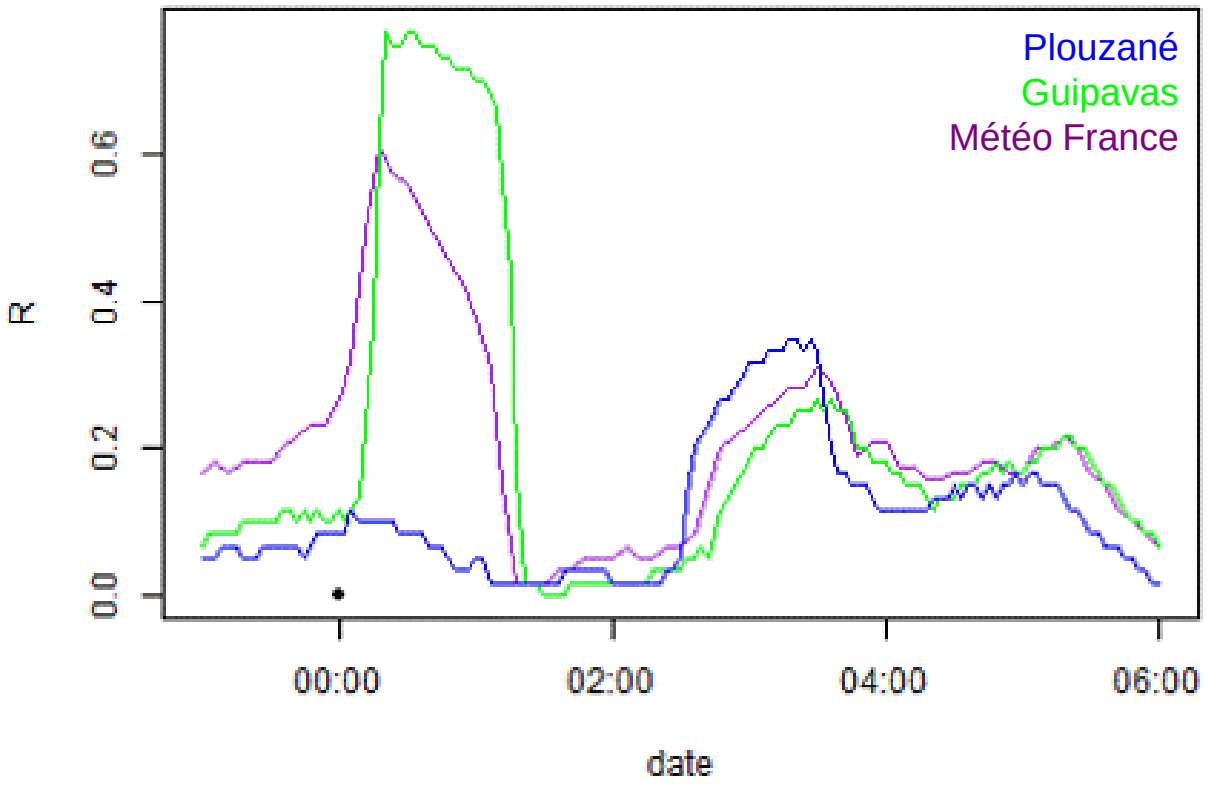


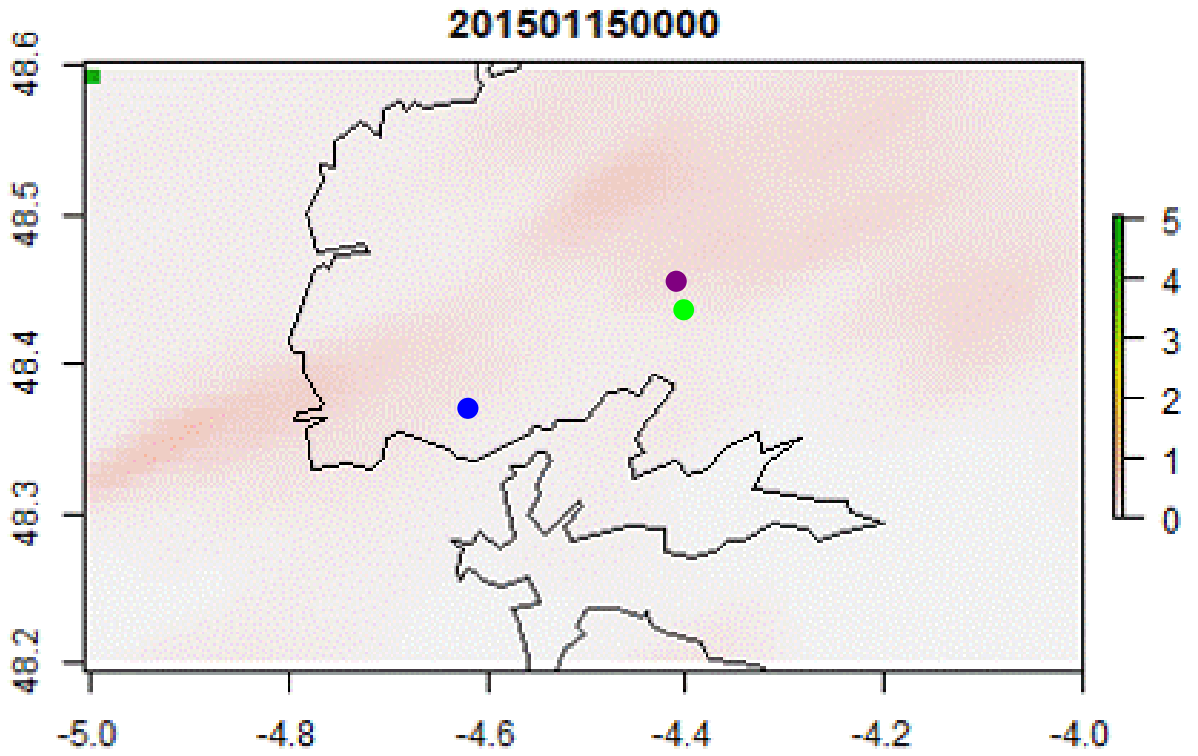
COMPARING RADAR VS. GAUGES

GENERAL AGREEMENT

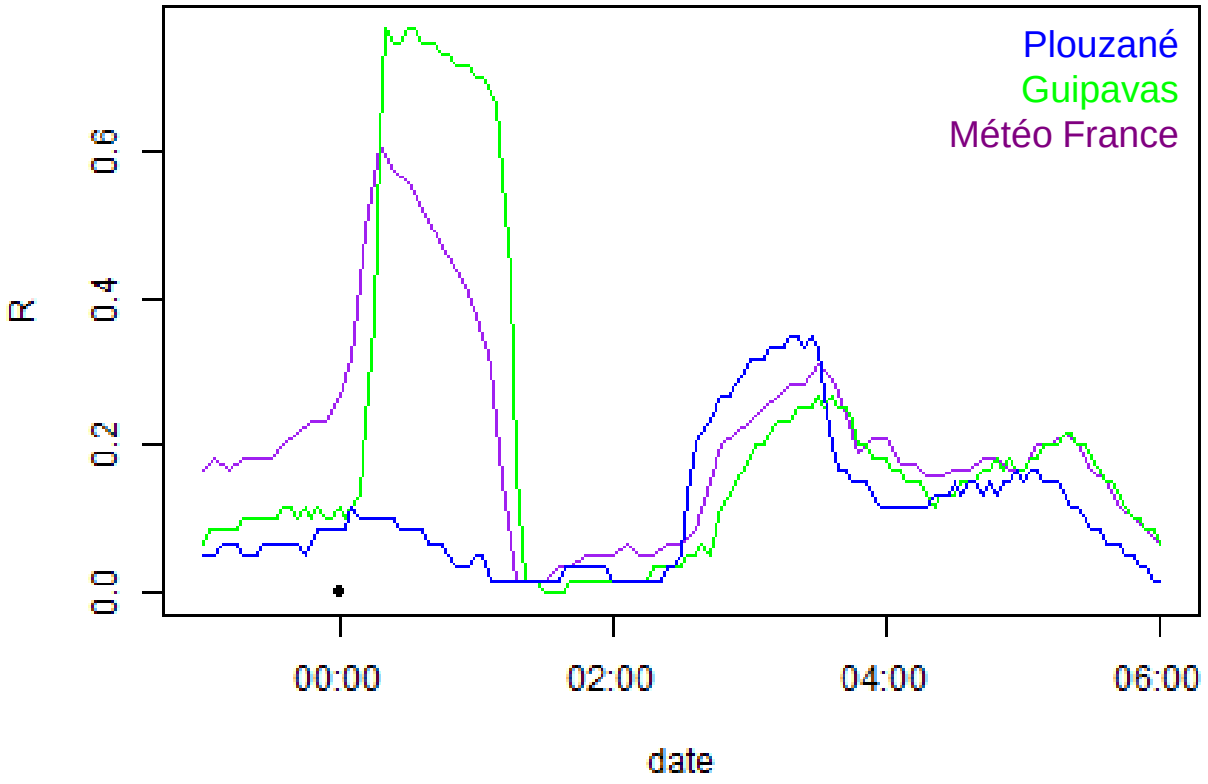


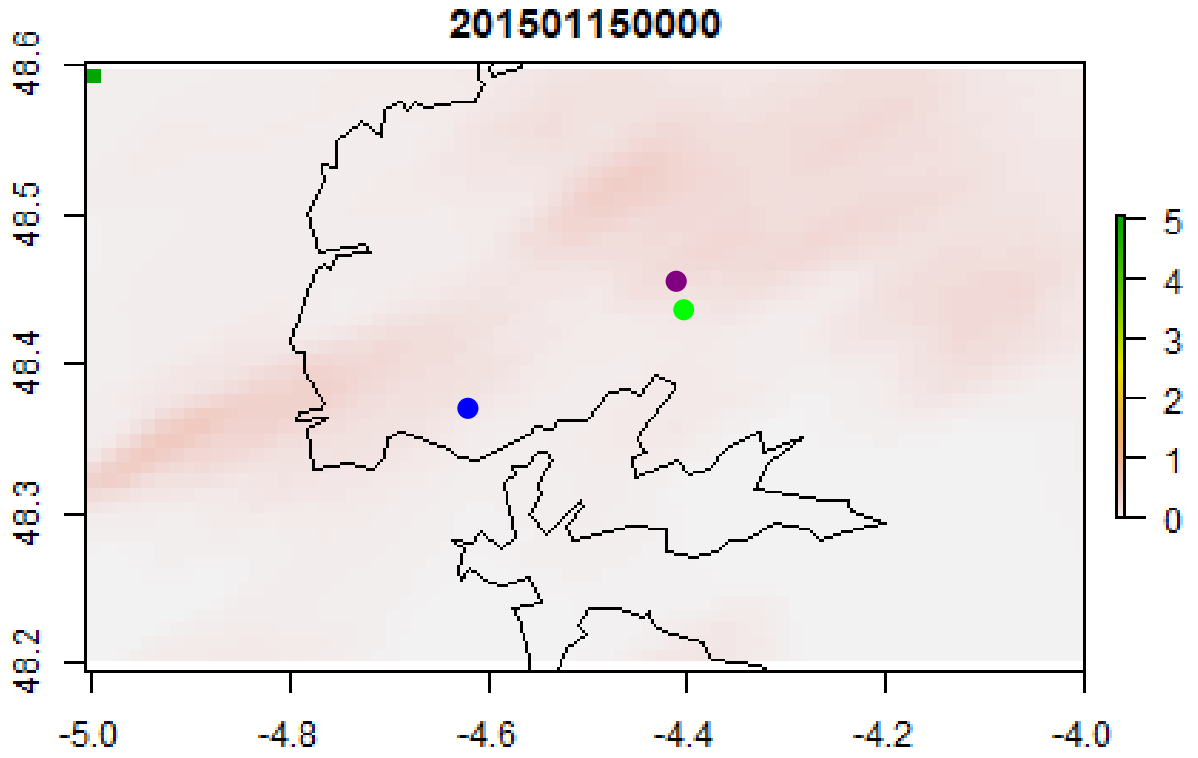
GENERAL AGREEMENT



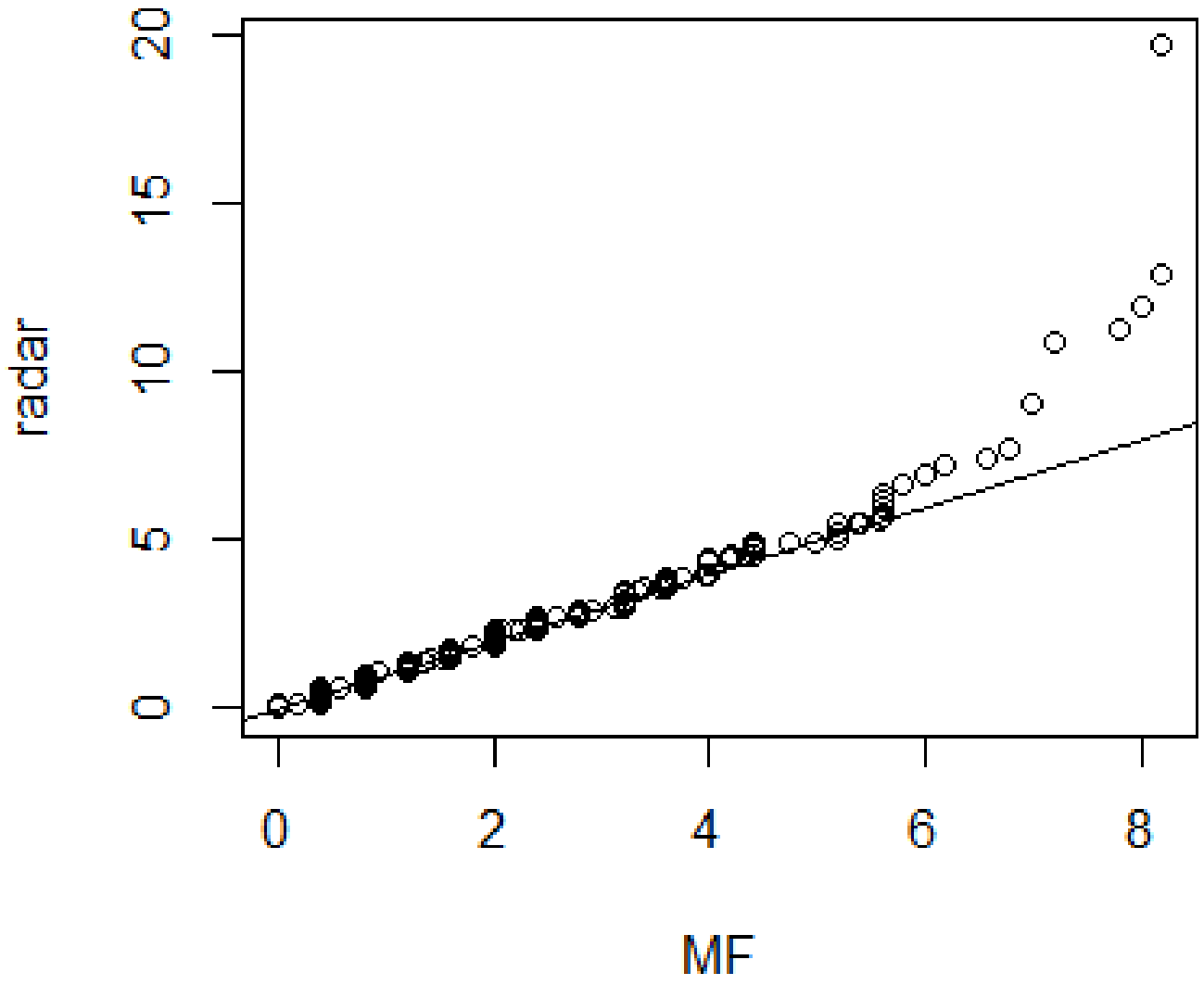


GENERAL AGREEMENT

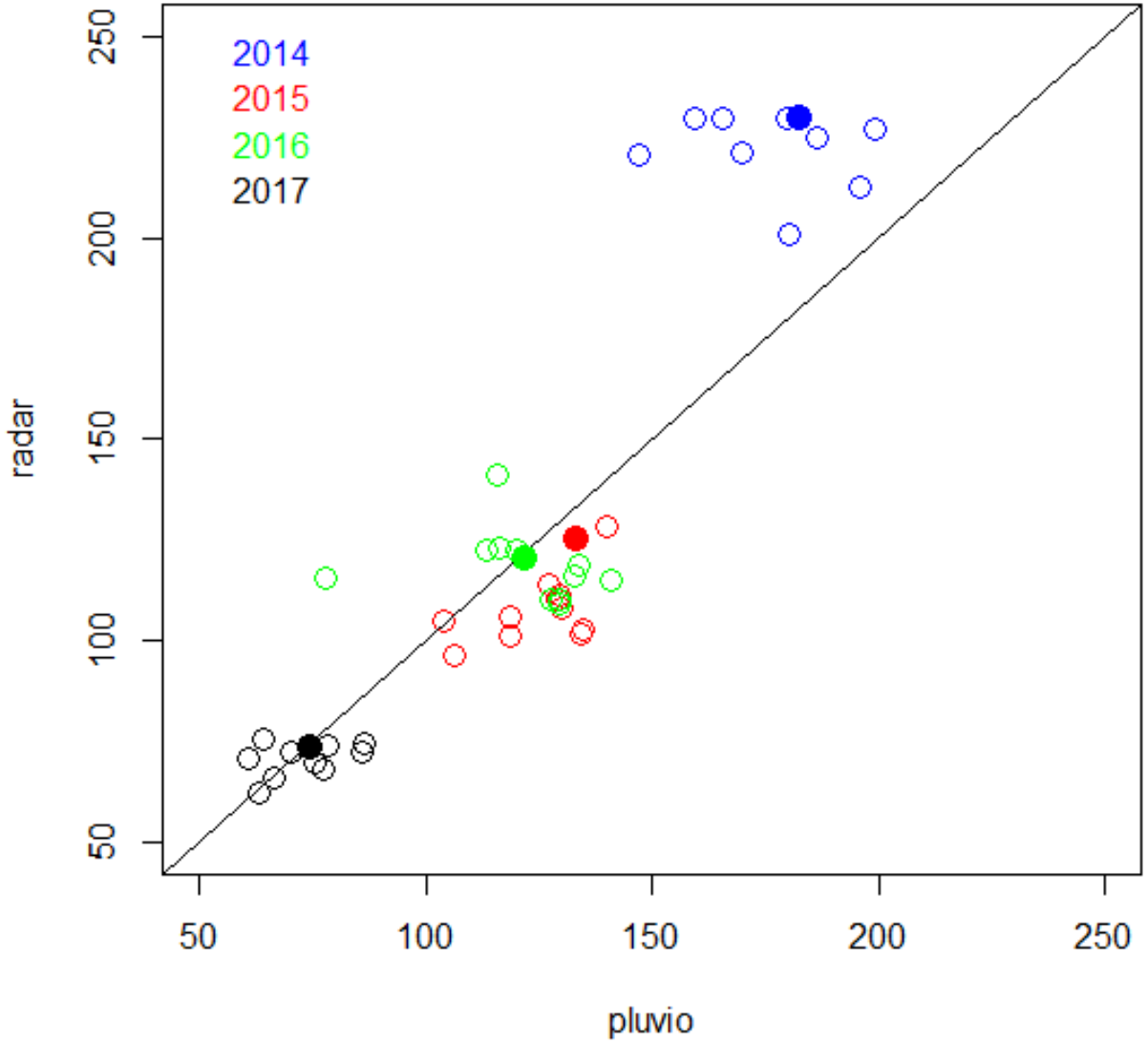




CALIBRATION ON MF GAUGE



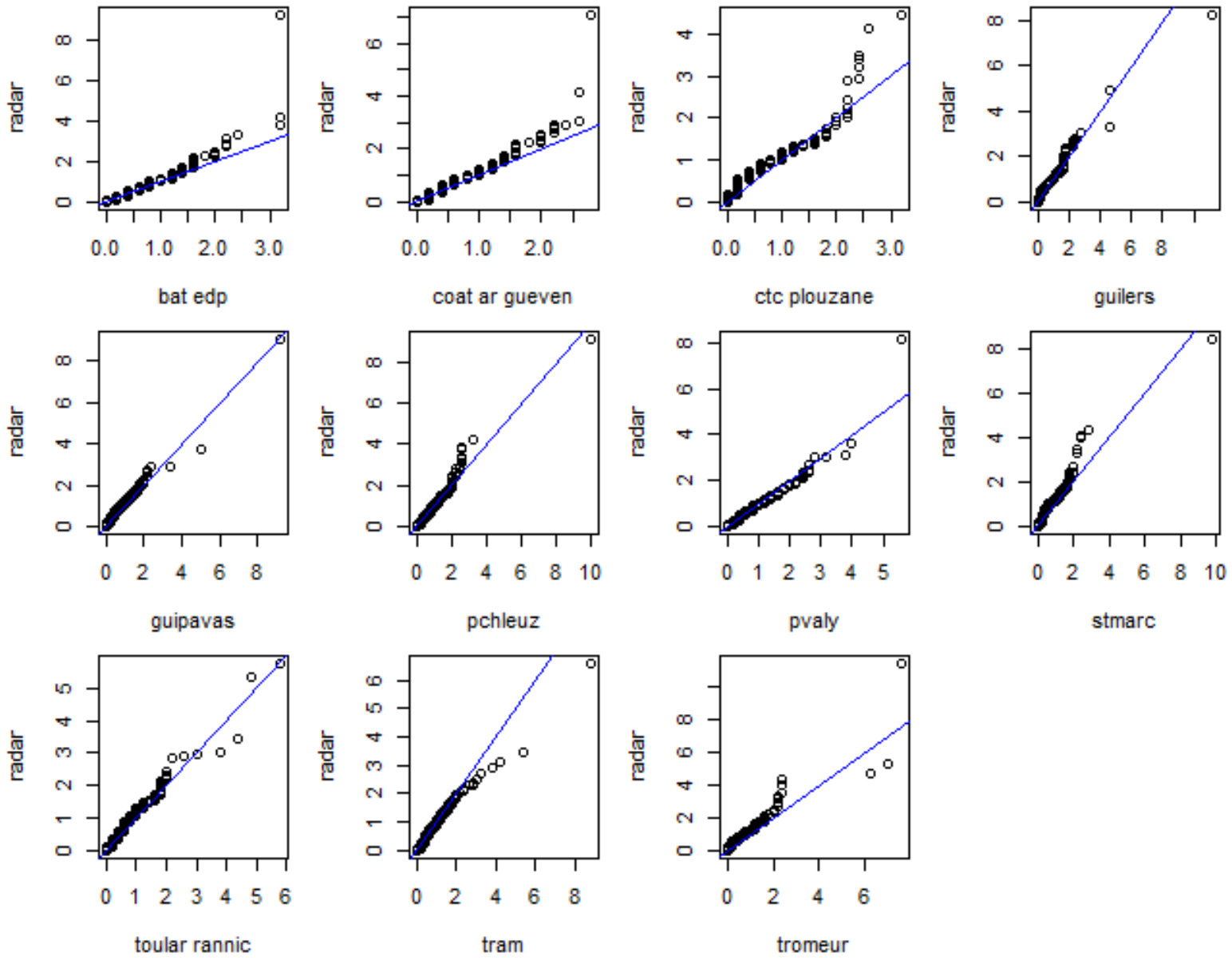
Is radar smoothing rain intensities?



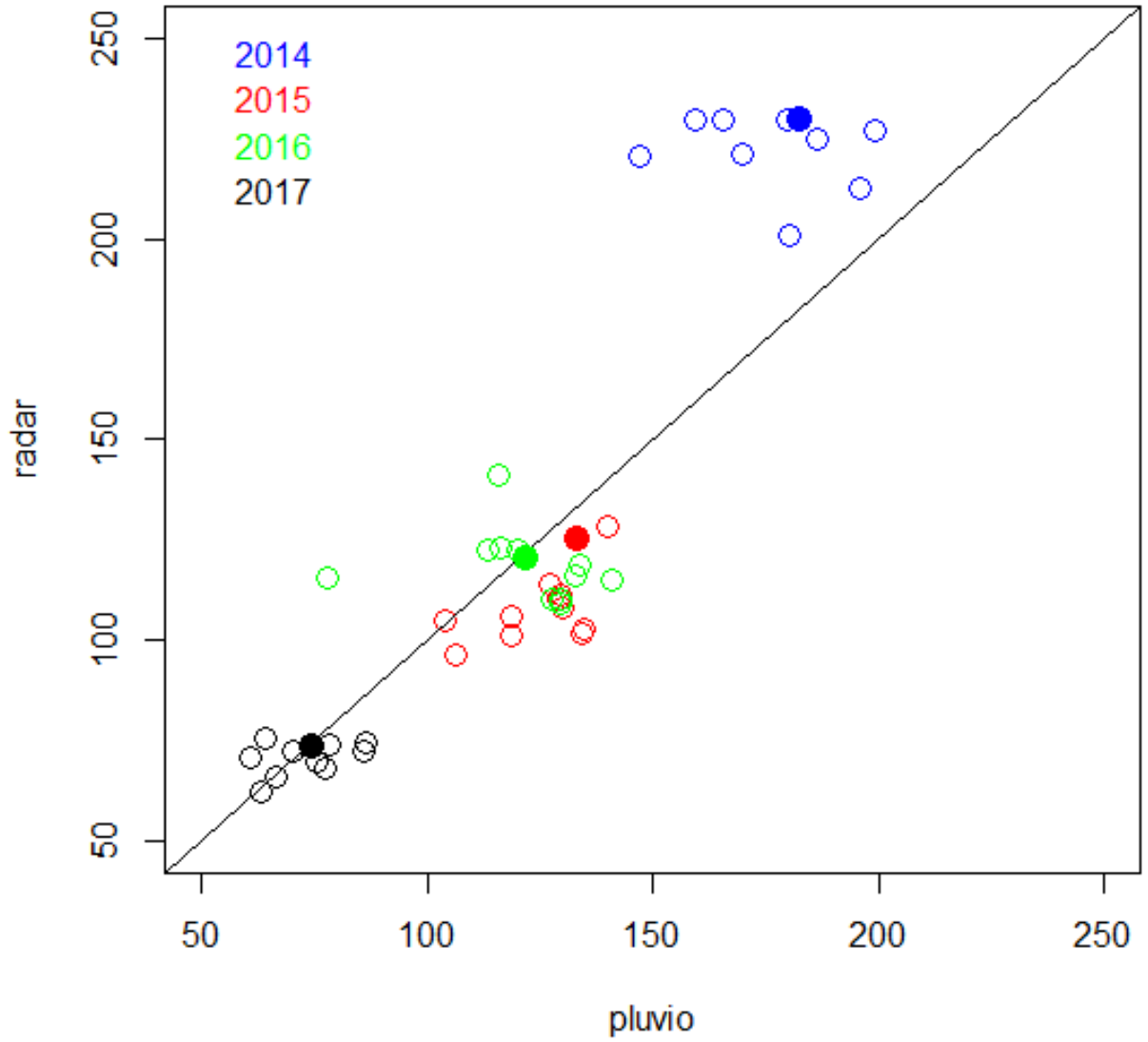
Radar over estimation

Radar under estimation

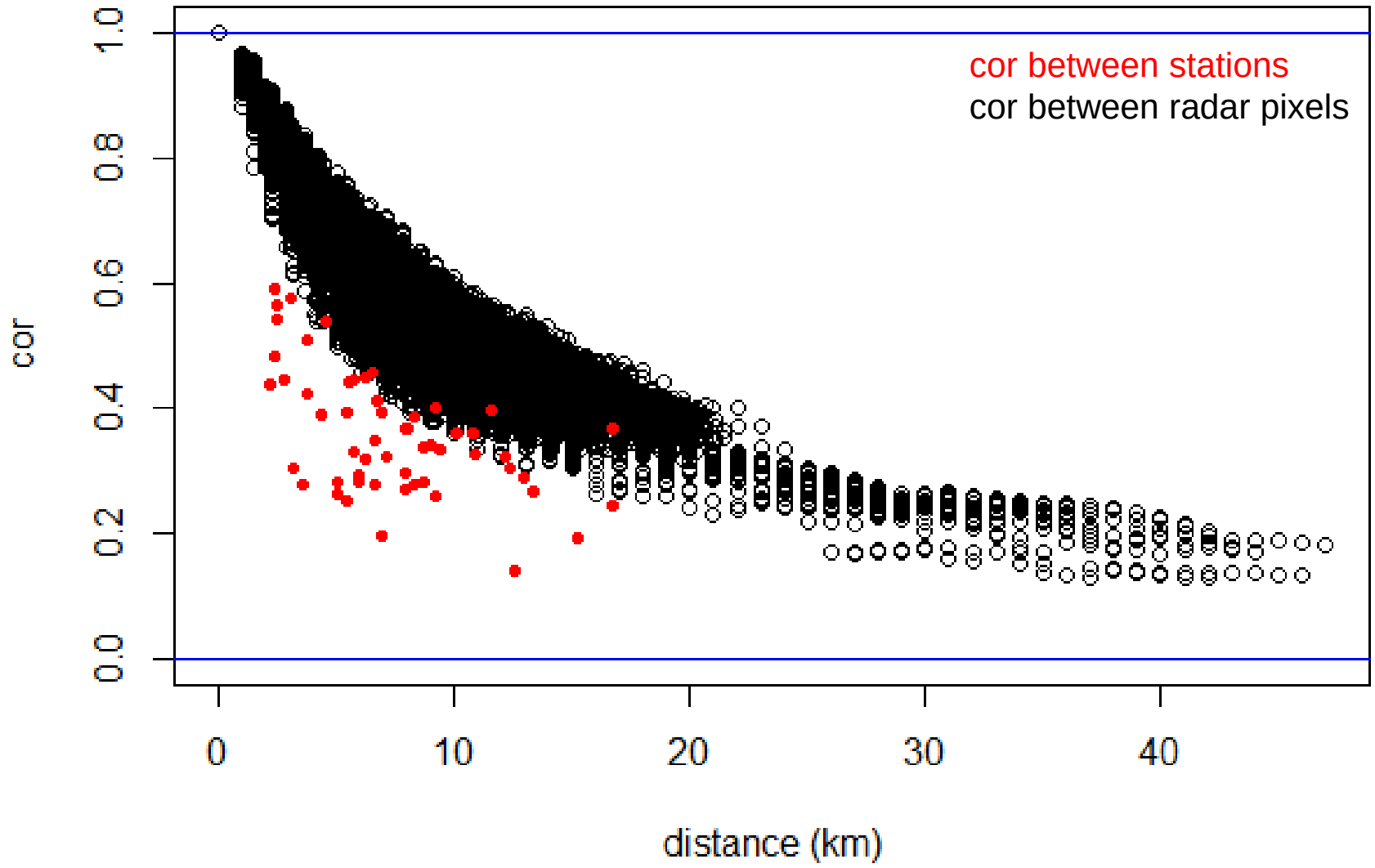
SMOOTHING INTENSITIES



Gauge spatial variation > radar spatial variation

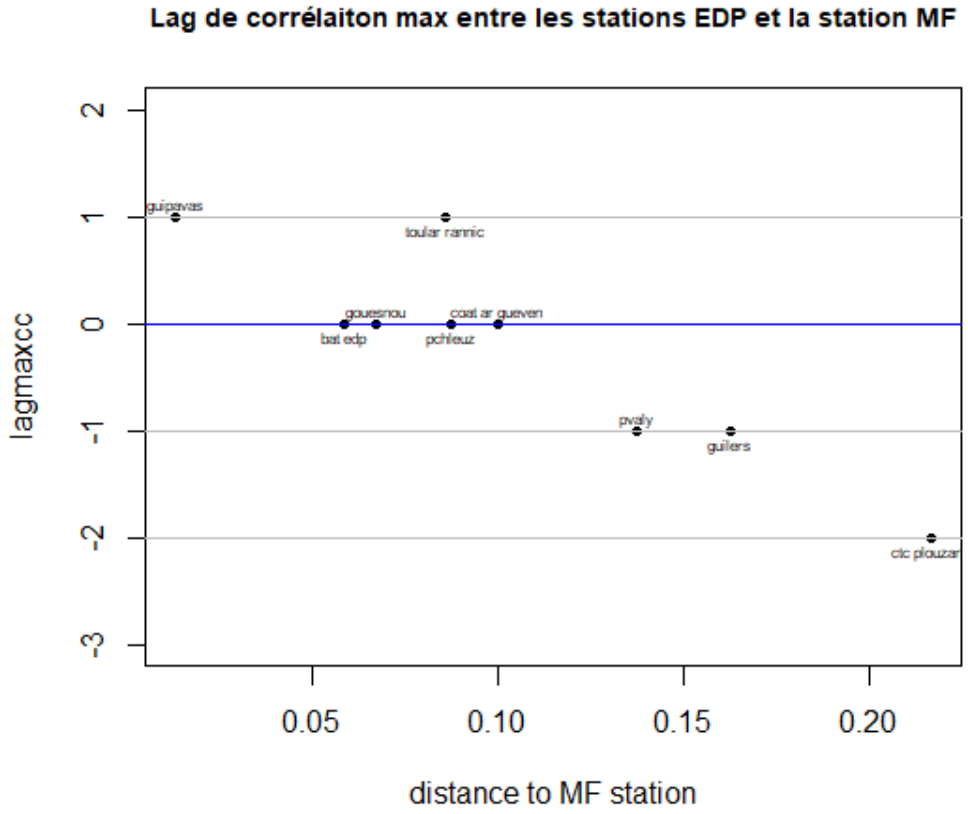


SPATIAL STRUCTURE

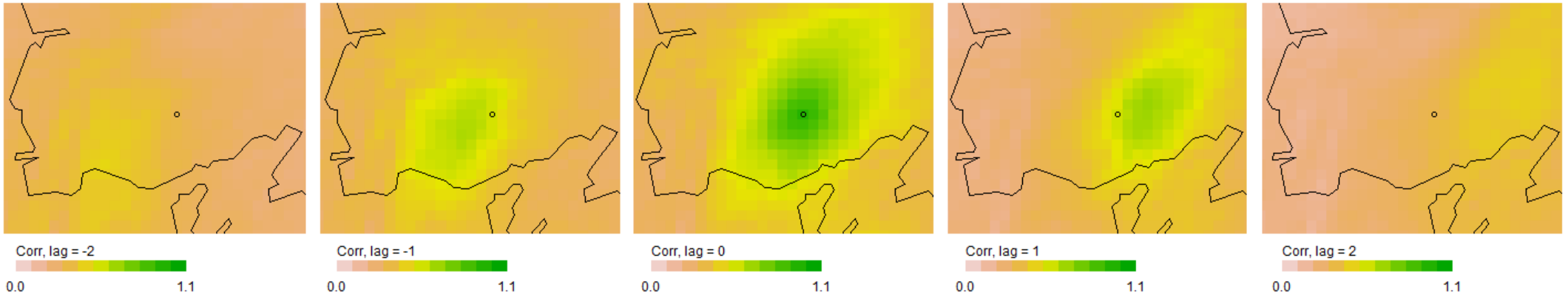


MOVEMENT

- Gauges



- Radar



CONCLUSION

CONCLUSION

Gauges network has many outliers

BUT they represent a reliable information in terms of values and spatial variability

Radar images are heterogeneous and heavily processed

BUT they have a very good representation of rain cells movement

Merging

1) movement from radar images to make a prediction

2) the values from gauges a kept according to whether or not they match the prediction

Thank you