

European Network on New Sensing Technologies for Air Pollution Control and Environmental Sustainability - *EuNetAir* COST Action TD1105

Focus Group Meeting on

Data Analysis of Aveiro Air Quality Sensors Intercomparison

WHO Collaborating Centre (CC) for Air Quality Management and Air Pollution Control - Federal Environment Agency (FEA)
Berlin, Germany, 17 April 2015

Action Start date: 01/07/2012 - Action End date: 30/06/2016 - Year 3: 2014-15 (*Ongoing Action*)

Proposal on How to Manage and Process the Aveiro AQ Sensors Database



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Scientific context and objectives

-Sensor technologies have been identified as a useful tool to complement existing air quality monitoring networks (AirMonTech, 2013; Snyder et al., 2013).

-The number and potential uses for sensors are increasing (Kumar et al., 2015). However, assessments of their field performance found large divergences between sensor and reference data, and even between different units of the same sensor type (Castell et al., 2013).

-Sensor technologies rapidly change, the main objective is to assess the field performance of pods for air quality monitoring under real-world conditions in an urban area in Portugal (Aveiro).

Description of Sensors Database to be Used

• Geotech/AQMesh/Envirodata (pods):

NO, NO₂, O₃, CO



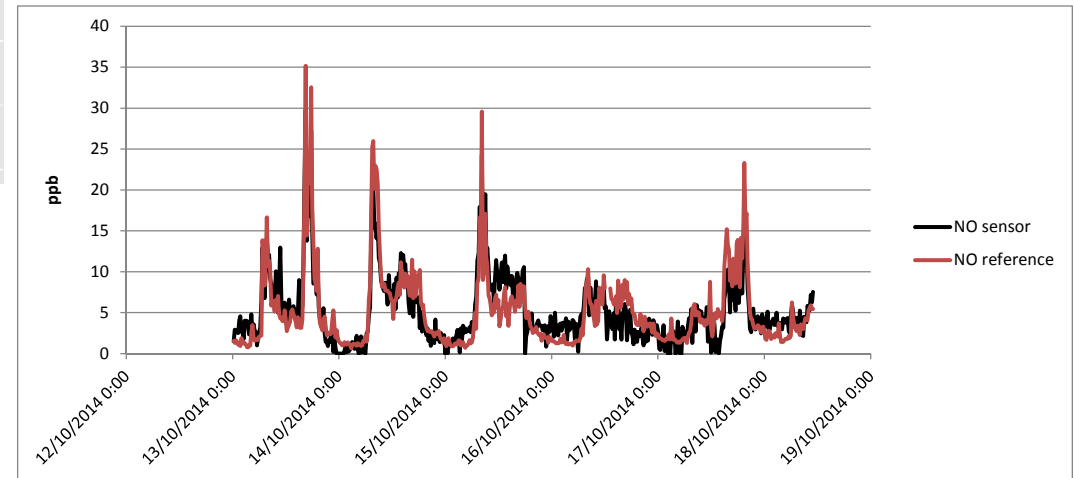
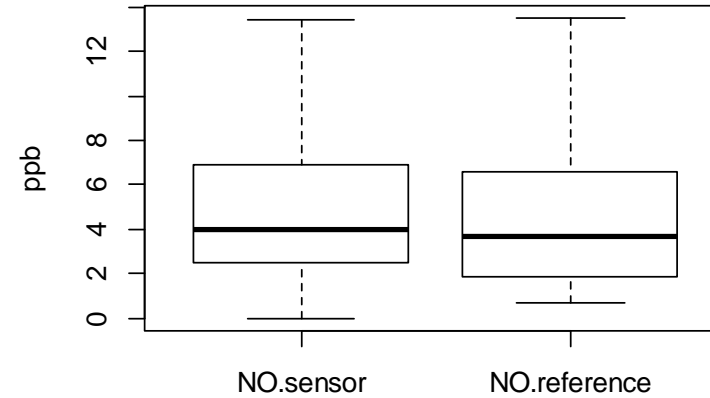
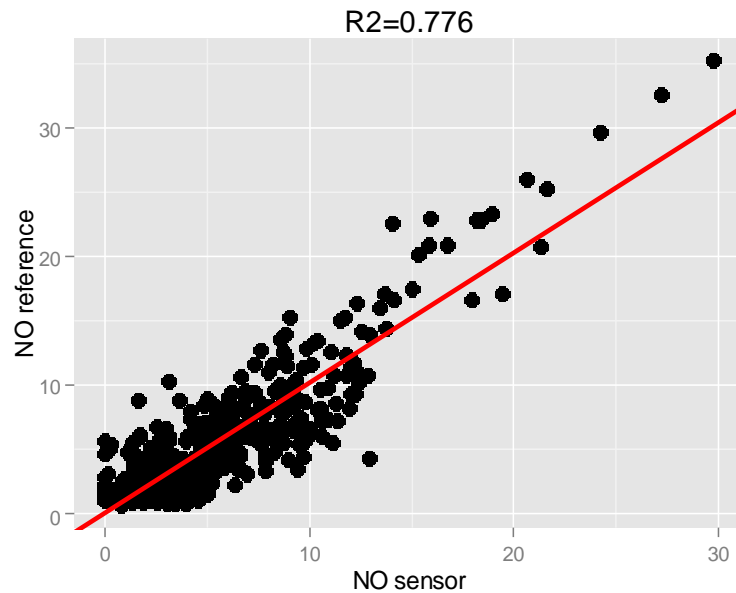
Alphasense

- Three pods were deployed, two of them failed
- Minimum temporal resolution: 15 min
- 524 valid measurements for NO, NO₂ and O₃ (data coverage: 37%), 1404 for CO (data coverage: 99%)
- Parameters evaluated: correlation with regard to the reference data, comparability between units of the same sensor, effect of meteorological conditions

Description of Sensors Database to be Used

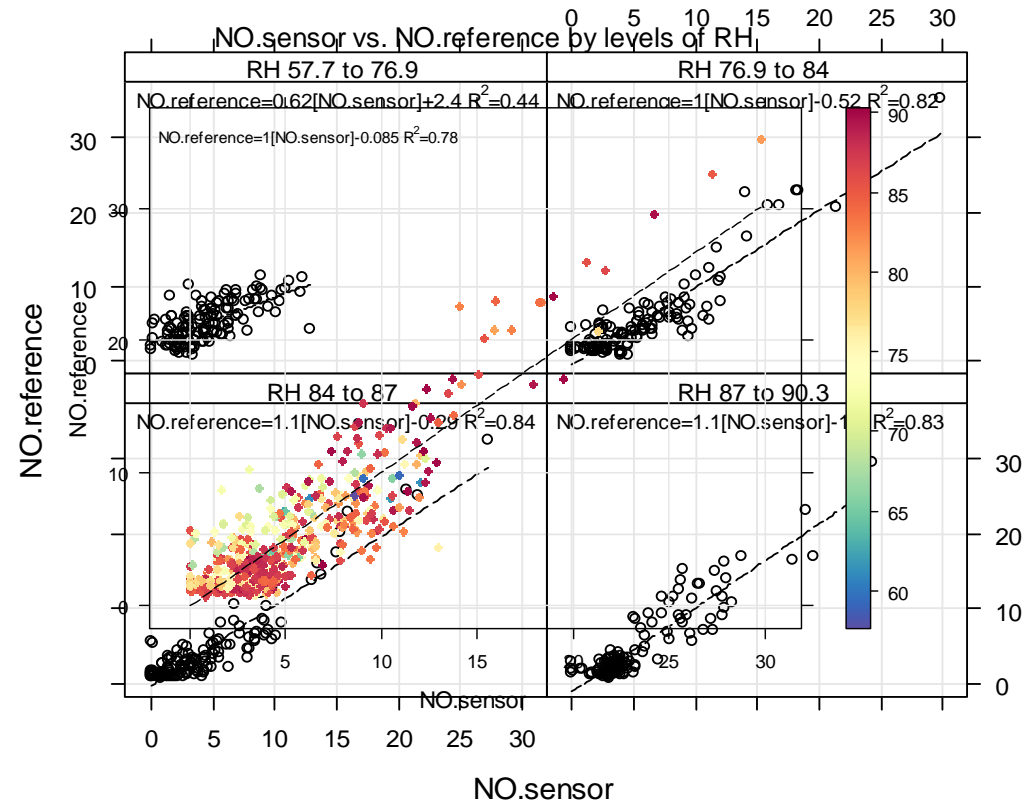
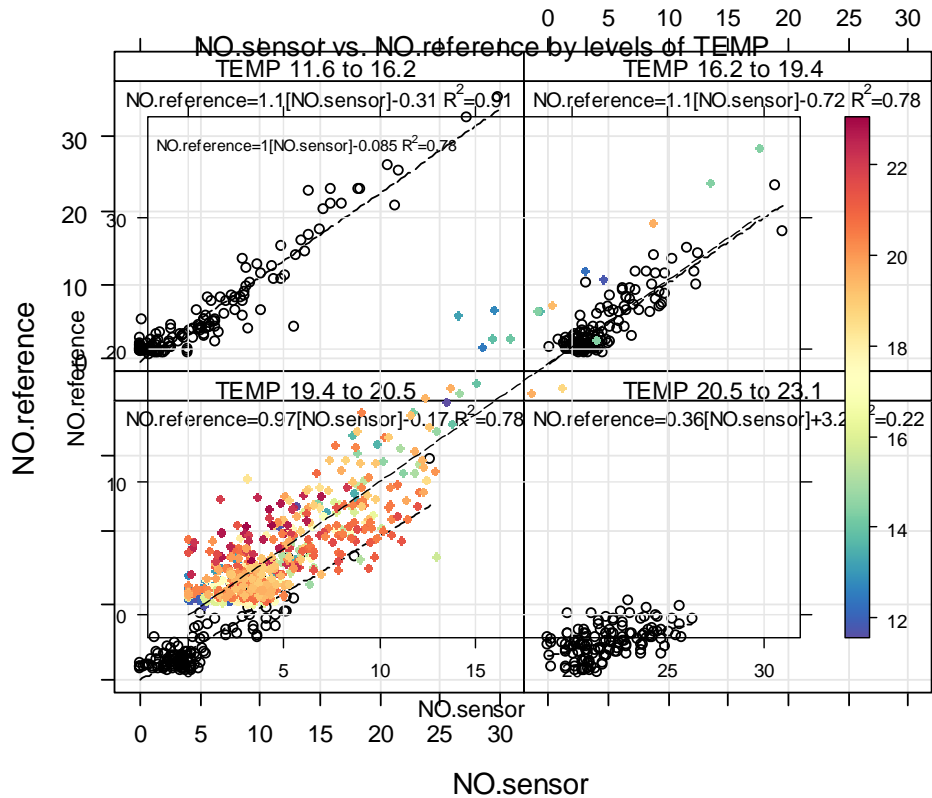
AVEIRO INTERCOMPARISON

NO



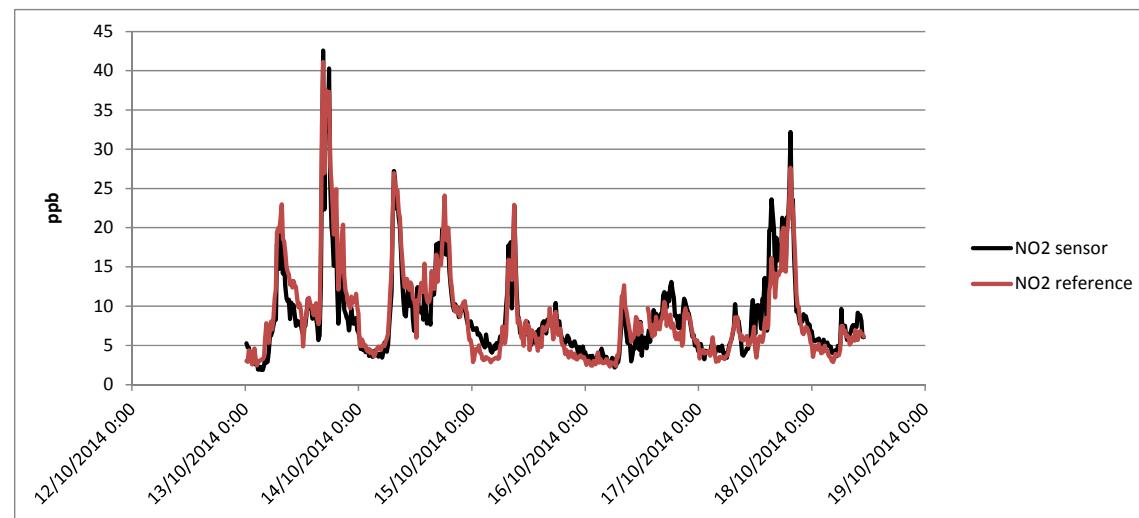
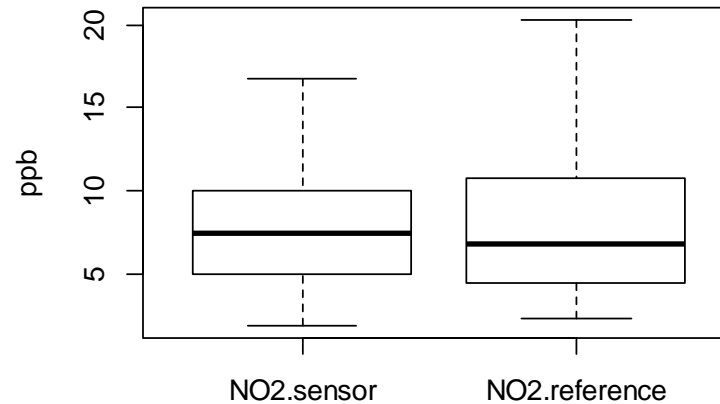
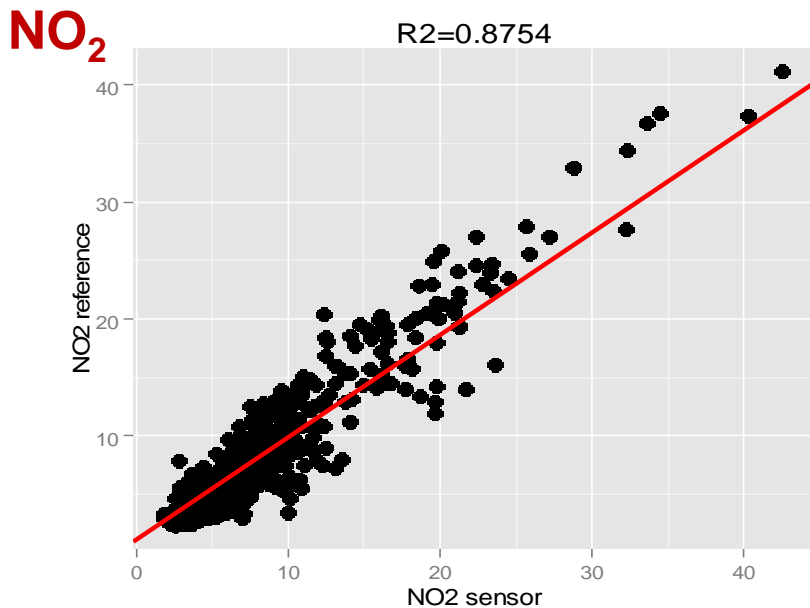
Description of Sensors Database to be Used

NO



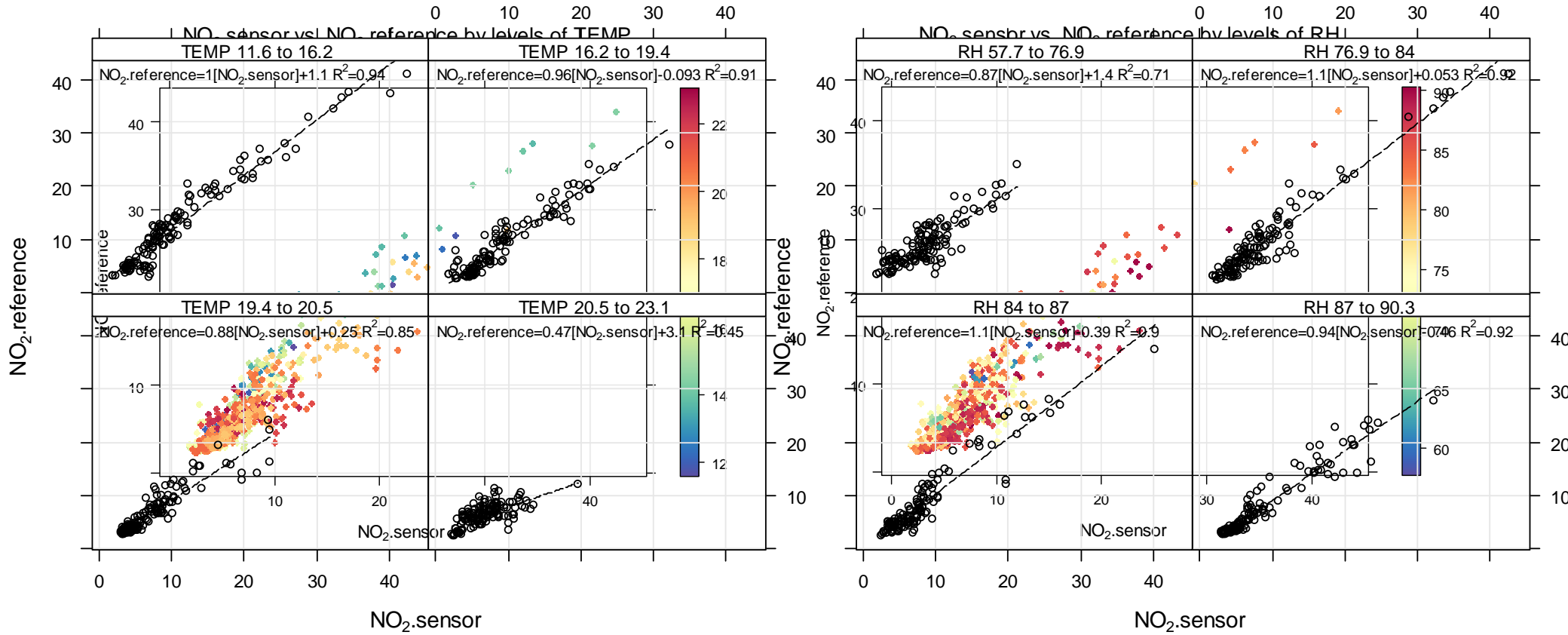
Description of Sensors Database to be Used

AVEIRO INTERCOMPARISON



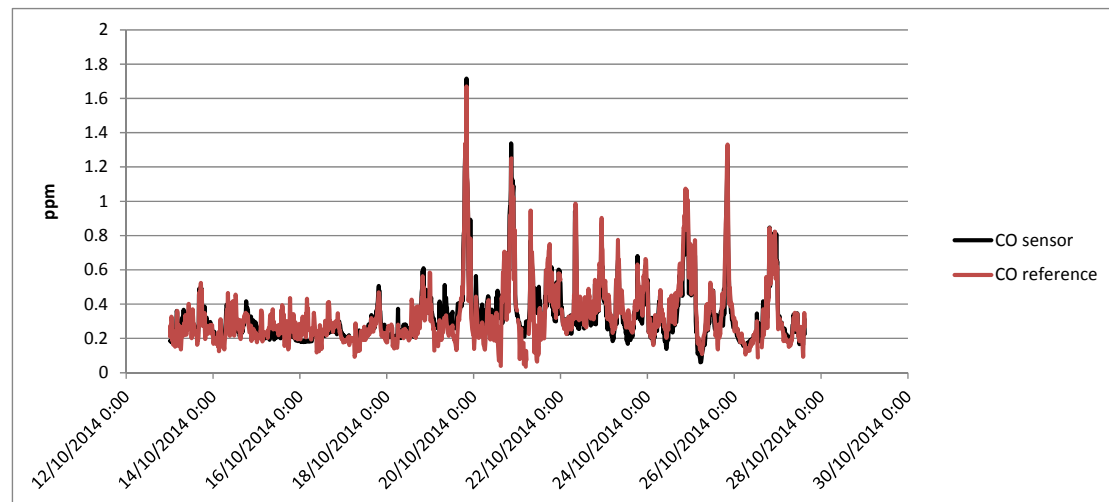
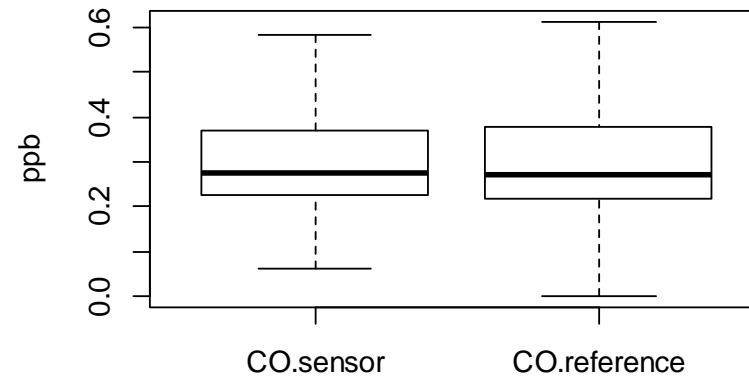
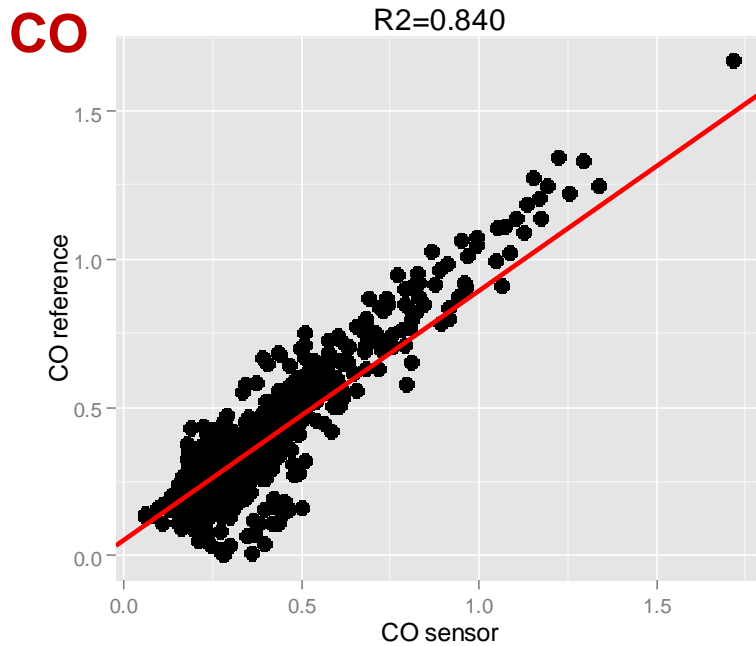
Description of Sensors Database to be Used

NO₂



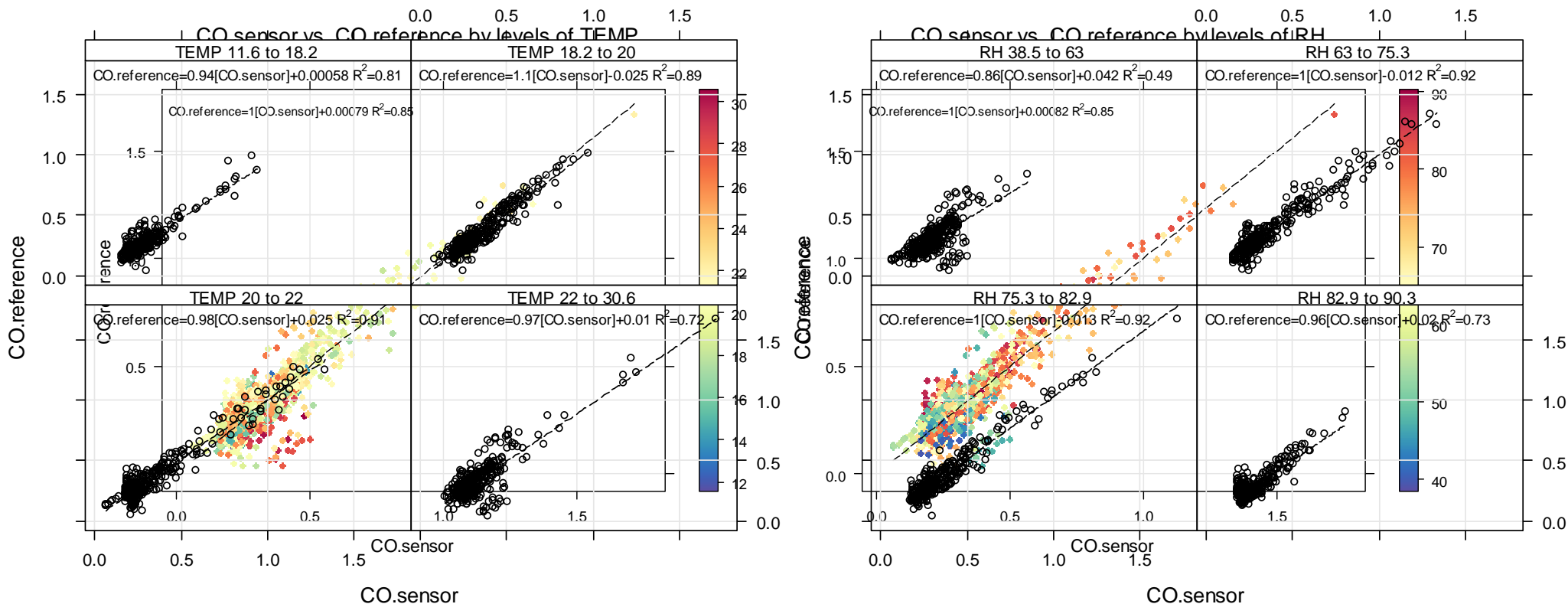
Description of Sensors Database to be Used

AVEIRO INTERCOMPARISON



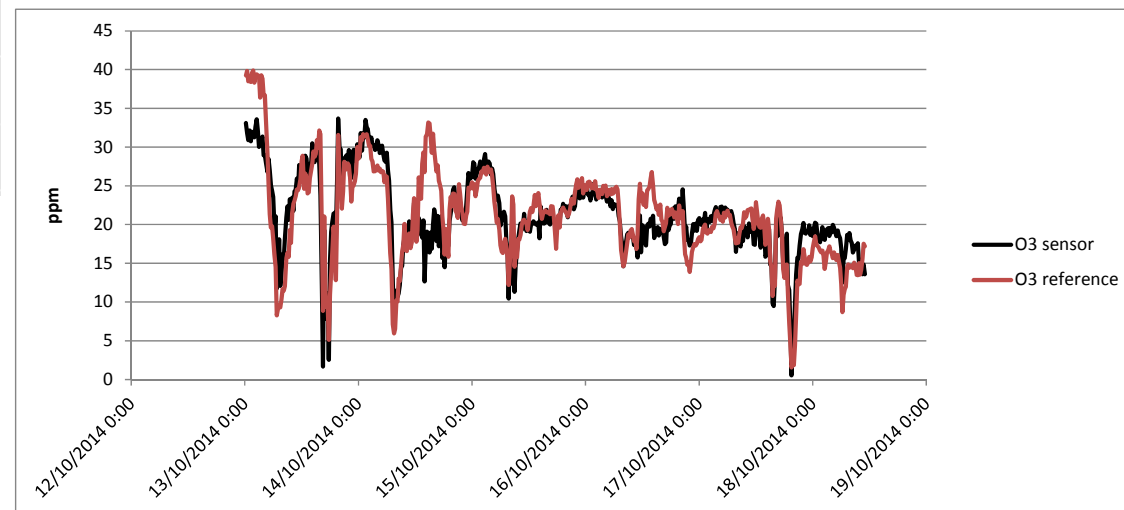
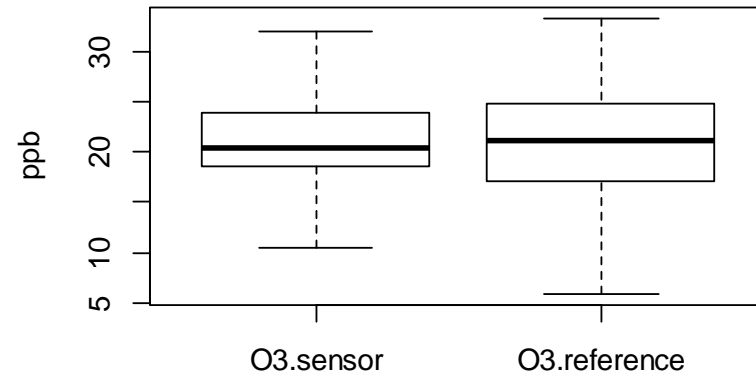
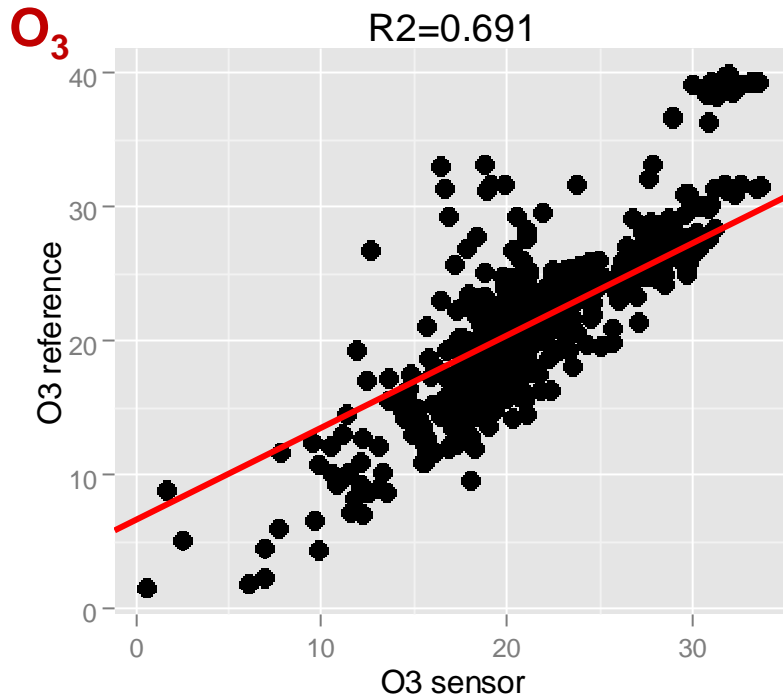
Description of Sensors Database to be Used

CO



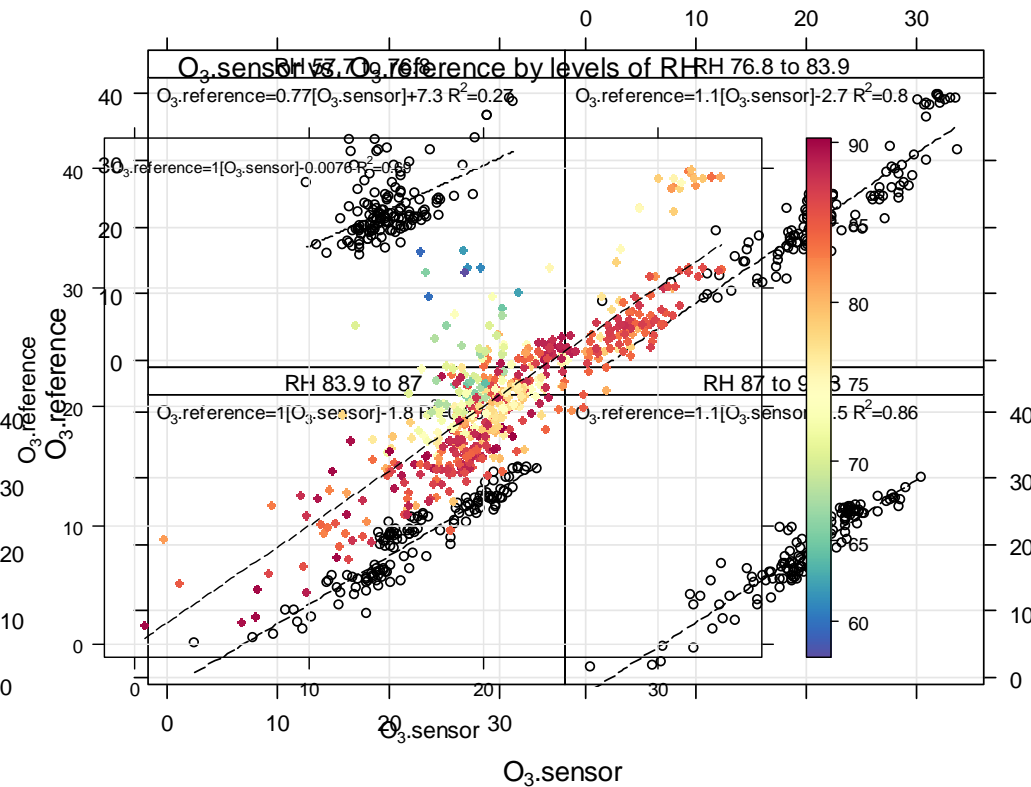
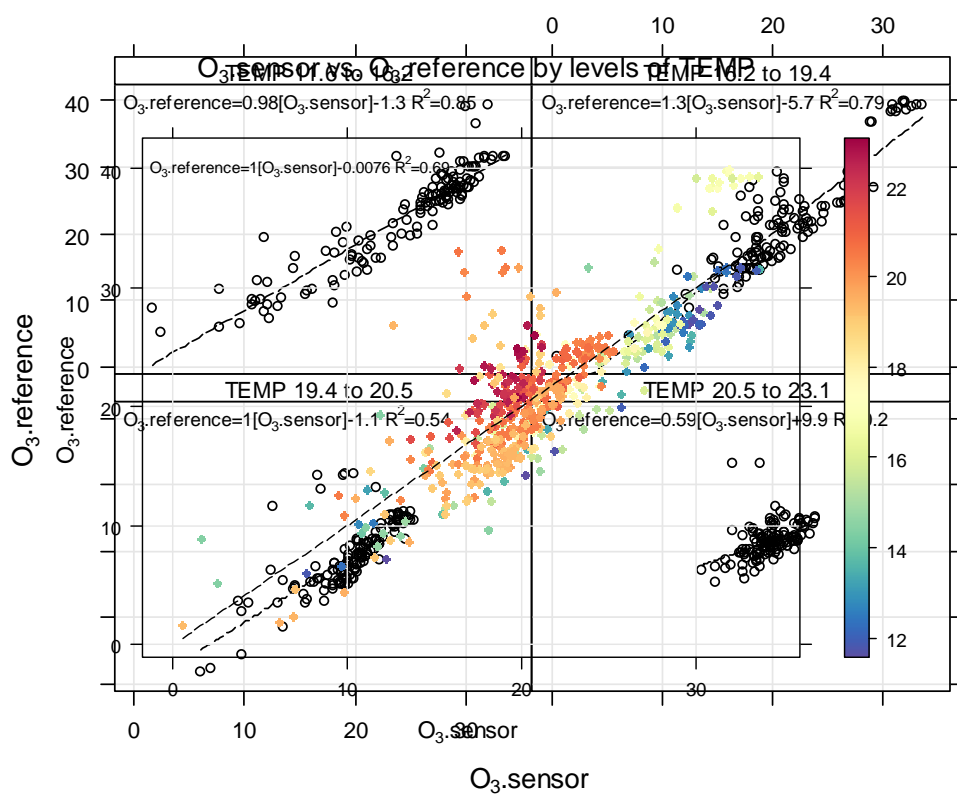
Description of Sensors Database to be Used

AVEIRO INTERCOMPARISON



Description of Sensors Database to be Used

O₃



SUMMARY AND CONCLUSIONS

- Data available for only one of the sensors
- Effect of meteorology
- Low relative standard deviations between reference instrumentation and sensors (0.01-0.54%)
- Coefficient of determination ranged between 0.69 and 0.87

- Future work:
- Comparability between units (same problems for all alphasense sensors??)
- Continue testing sensors in the urban reference monitoring site of Barcelona and specific campaigns (indoor schools)

*** PREVIOUS MEASUREMENTS IN BARCELONA (from October 2013 and ongoing) Gases**

- CanarIT: gases
- Geotech/AQMesh/Envirodata (pods): gases
- Urbiótica: gases
- Dylos: PM
- Wasmote Libelium: O₃
- Dylos: PM
- AirBeam: PM



Particles





THANK
YOU!

