VALIDATION OF THE RIO-IFDM-OSPM MODEL CHAIN USING THE ANTWERP "CURIEUZENEUZEN" CITIZEN SCIENCE MEASUREMENT CAMPAIGN

Wouter Lefebvre, H. Hooyberghs, B. Maiheu, J. Van den Bossche, S. Janssen

THE "CURIEUZENEUZEN" CAMPAIGN

- Citizen science campaign

- About 2000 locations (Palmes tubes)

- Measurements during 4 weeks (May 2016)
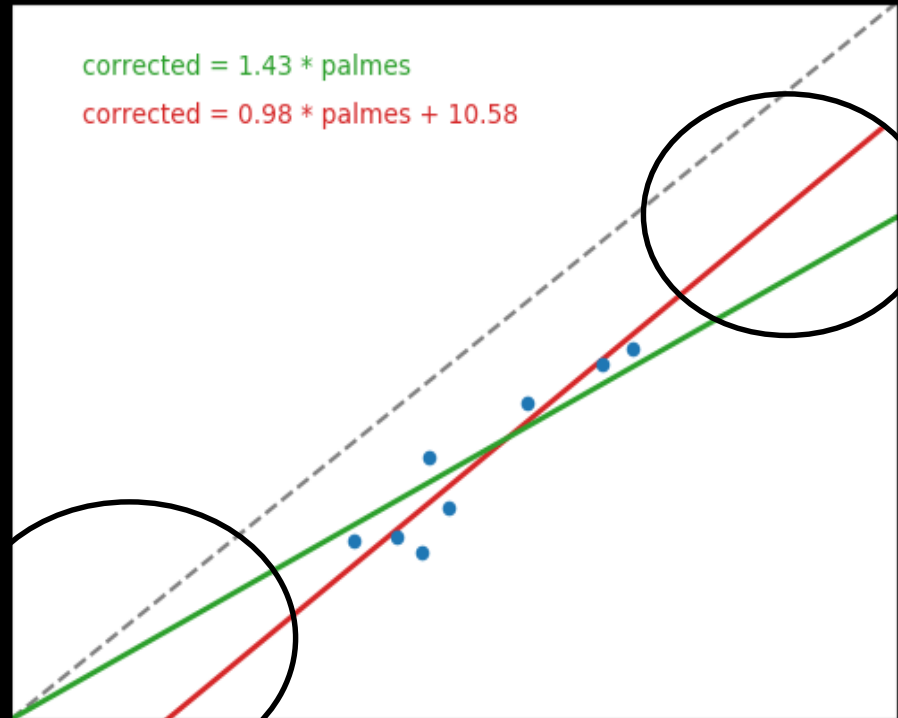
- Attached to V-shaped cardboard systems

- Also passive samplers at official measurement locations

- Calibrated using red line

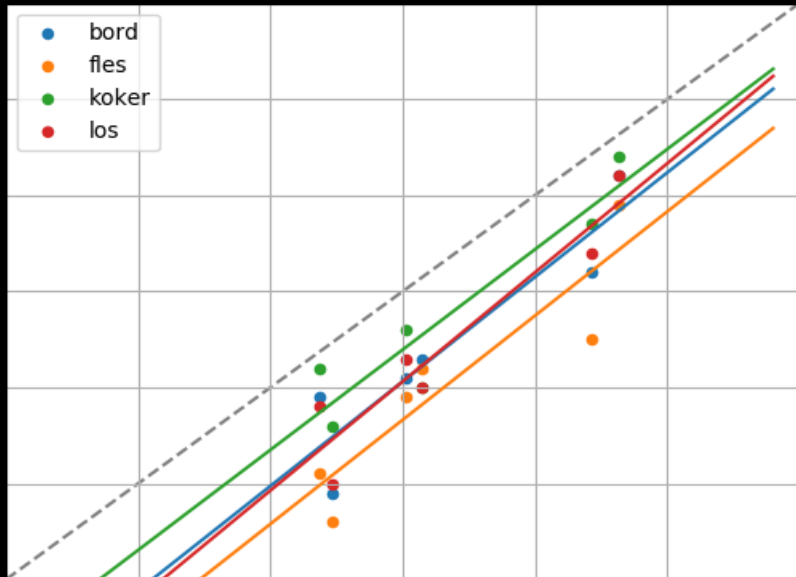- Large possible errors at low/high values

Hmmm…, not using the cardboard here

corrected = 1.43 * palmes
corrected = 0.98 * palmes + 10.58

THE "CURIEUZENEUZEN" CAMPAIGN: 2ND CALIBRATION

- Effect of cardboard panel?
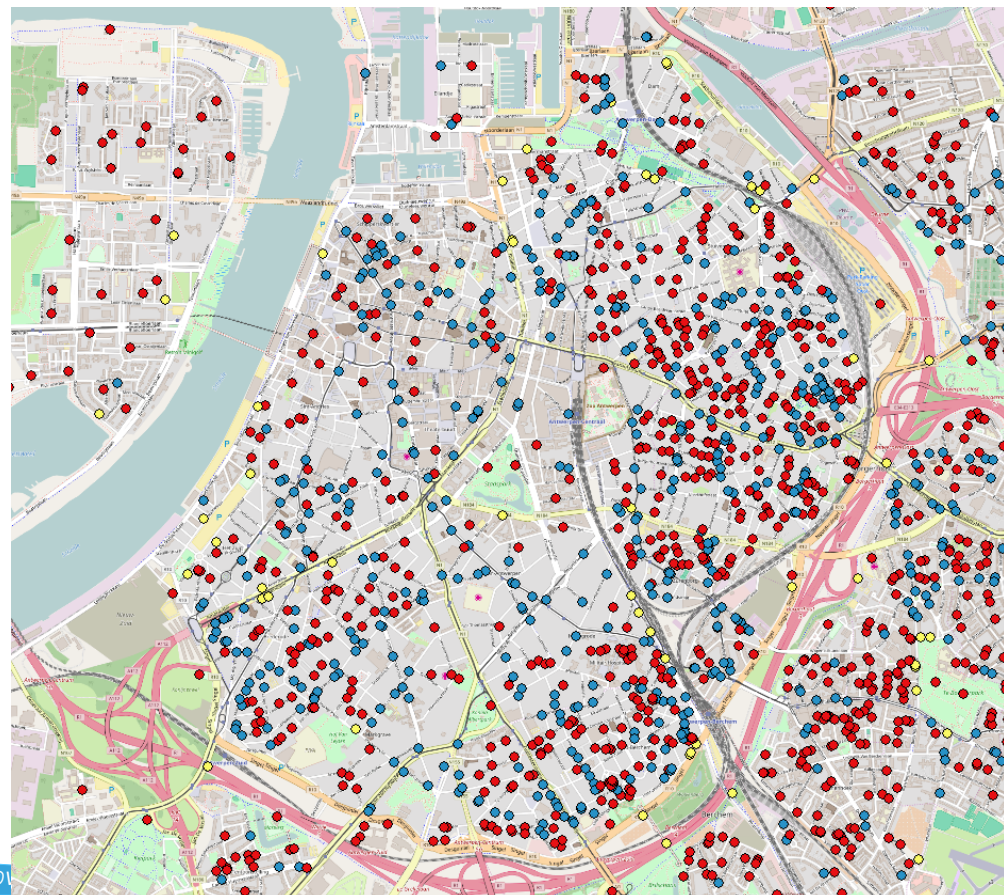- New calibration campaign July-August 2016 with 4 fixation systems


Extra calibration based on these measurements

THE "CURIEUZENEUZEN" CAMPAIGN

- Estimated uncertainty on measurements: 16% (in concentration interval covered by official stations)

- 2000 measurements => validation of model

THE RIO-IFDM-OSPM MODEL CHAIN

- Combination of Land Use Regression model RIO (4x4 km²) with Gaussian Dispersion Model IFDM and Street Canyon Model OSPM
- Using local meteorology
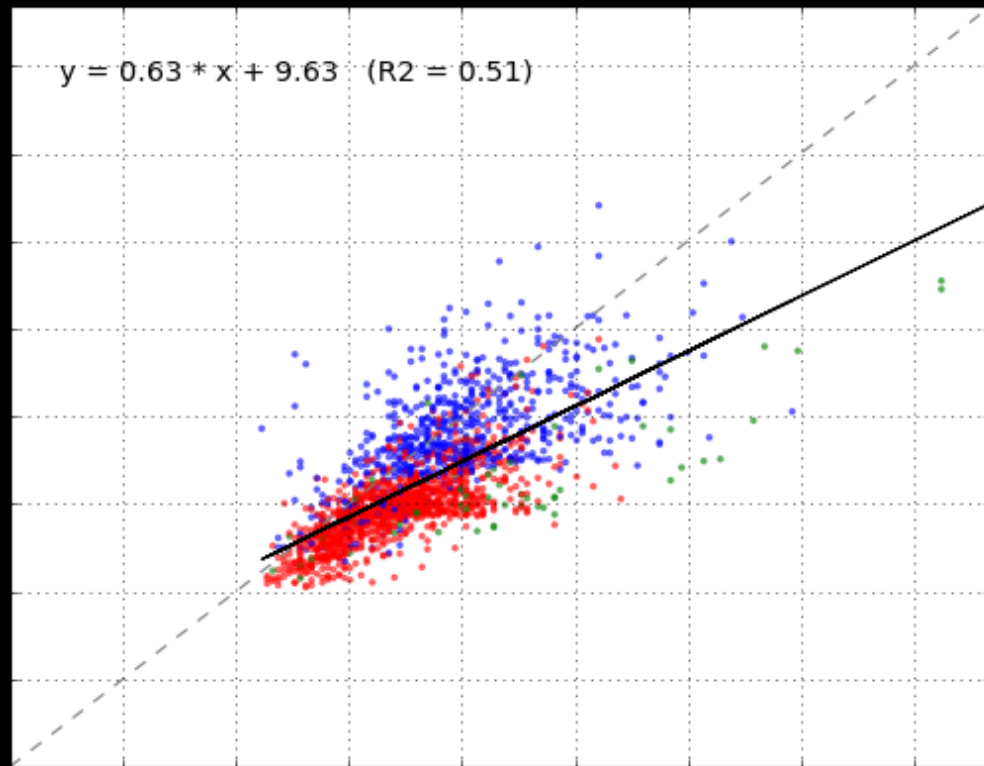- Same model chain as in Lefebvre et al. (2013)

NO2 (µg/m³)

<= 37
38 - 39
40 - 41
42 - 43
44 - 45
46 - 47
48 - 49
>= 50
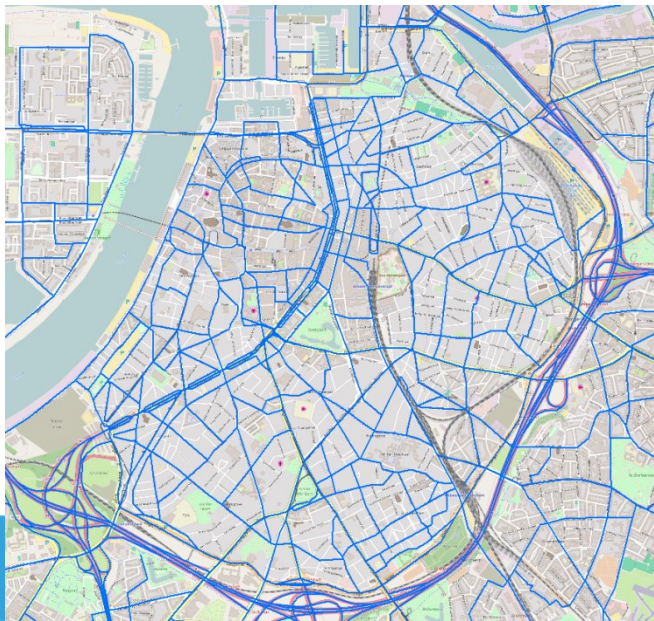
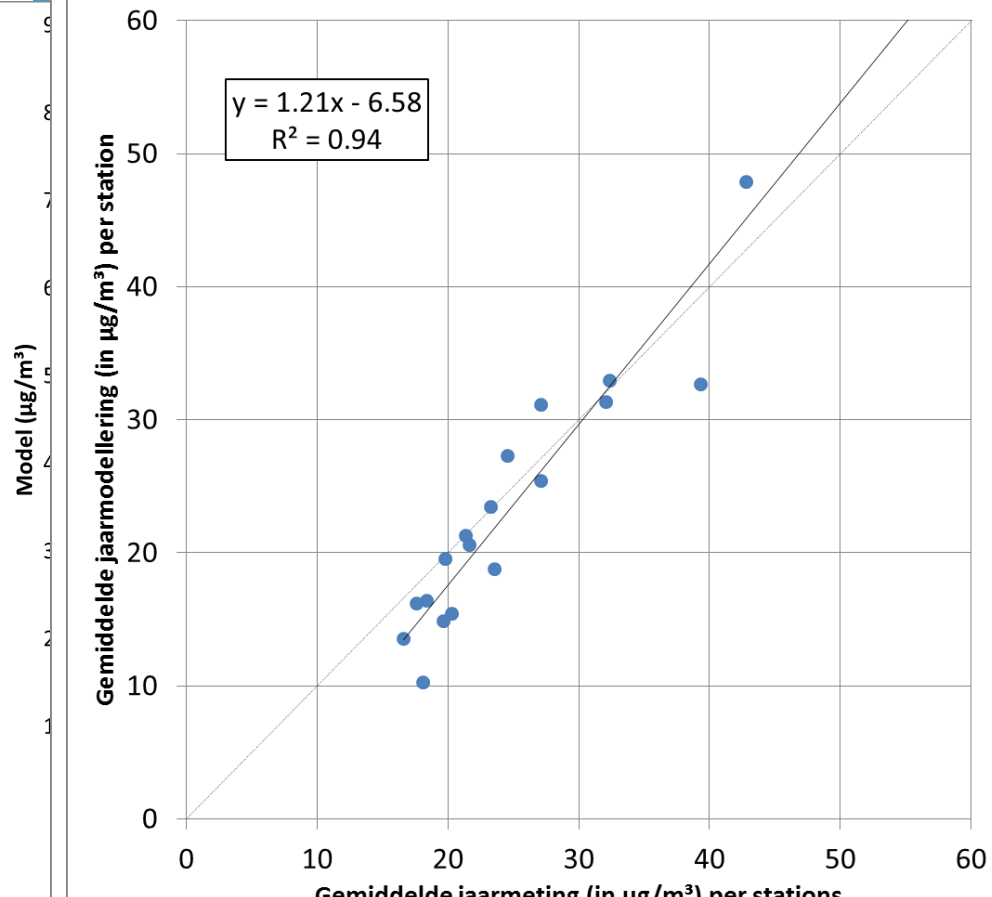# CURIEUZENEUZEN: RESULTS
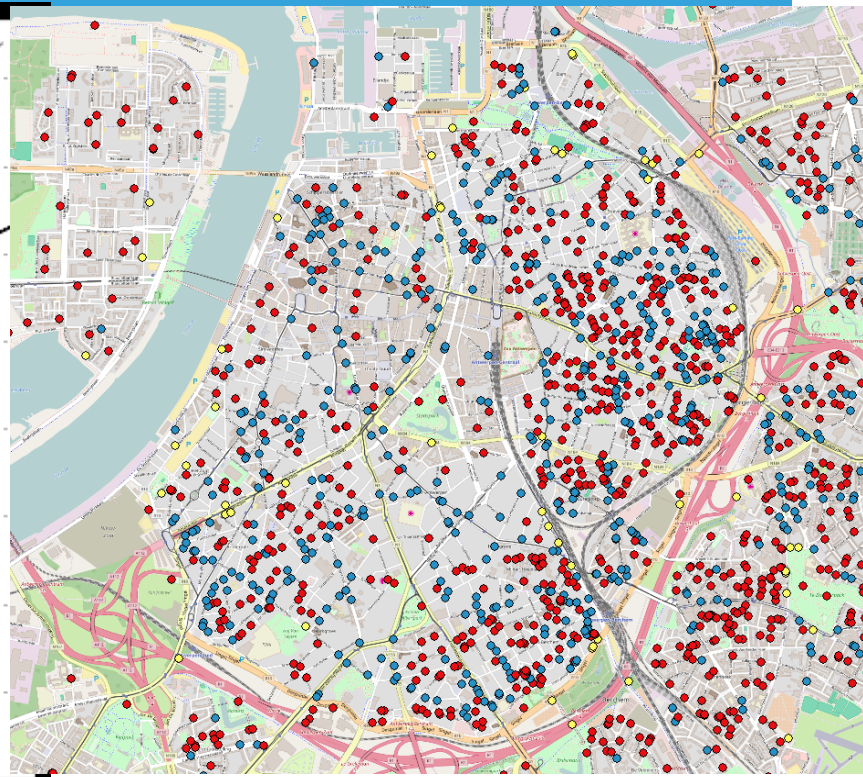
- Every dot = measurement location

VALIDATION GRAPH…

$y = 0.63 * x + 9.63$ $(R2 = 0.51)$

Hmmm…, I've seen better

Lefebvre et al., 2013

Lefebvre et al., 2017

$$y = 0.63 * x + 9.63 \quad (R2 = 0.51)$$

VALIDATION GRAPH…

$$y = 0.63 * x + 9.63 \quad (R2 = 0.51)$$
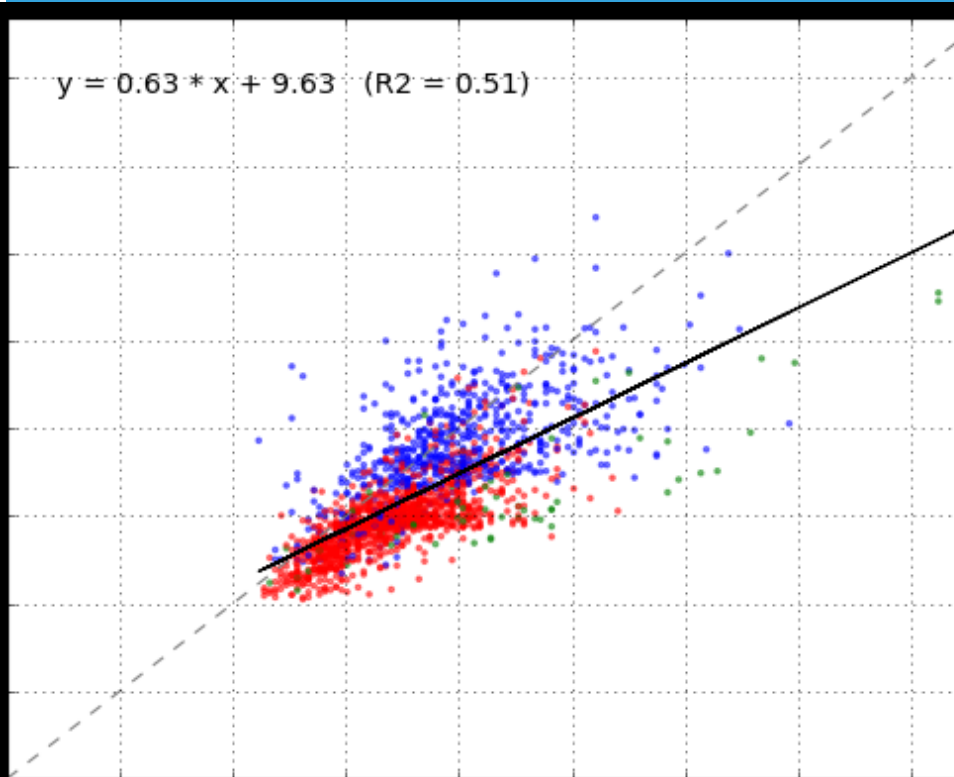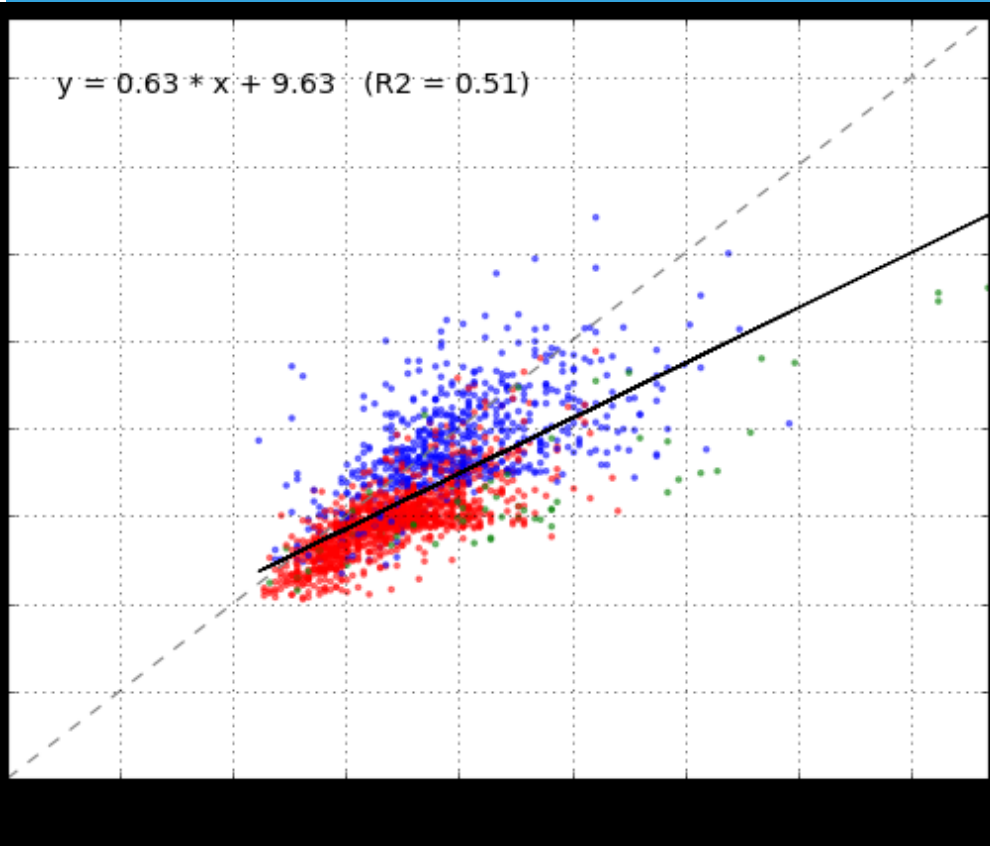
Furthermore:
- Uncertainties in height of the measurement
- Uncertainties in calibration
- Start-stop traffic
- Small calibration range

CONCLUSIONS

- Citizen science: exciting new opportunities but also challenges (deharmonization)

- Need of a good scientific knowledge within campaign in order to be useful for model validation