

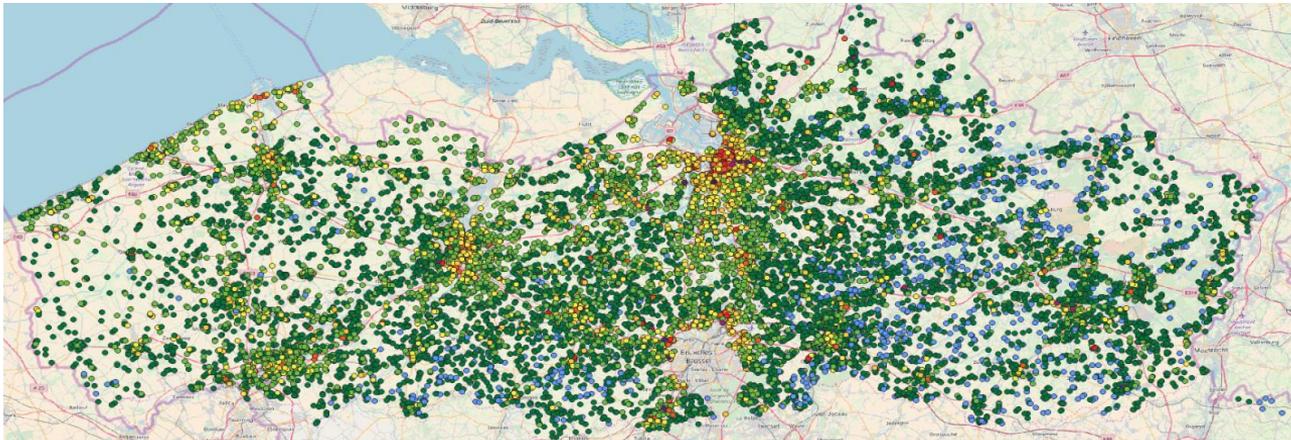
The background of the slide is a photograph of a city skyline. In the foreground, there is a lush green field with some rocks. In the middle ground, there are several modern high-rise apartment buildings with glass facades. The sky is a clear, bright blue with a few wispy clouds. The sun is visible in the upper right, creating a lens flare effect.

VALIDATION OF THE ATMO-STREET MODEL WITH THE CURIEUZENEUZEN CAMPAIGN DATA

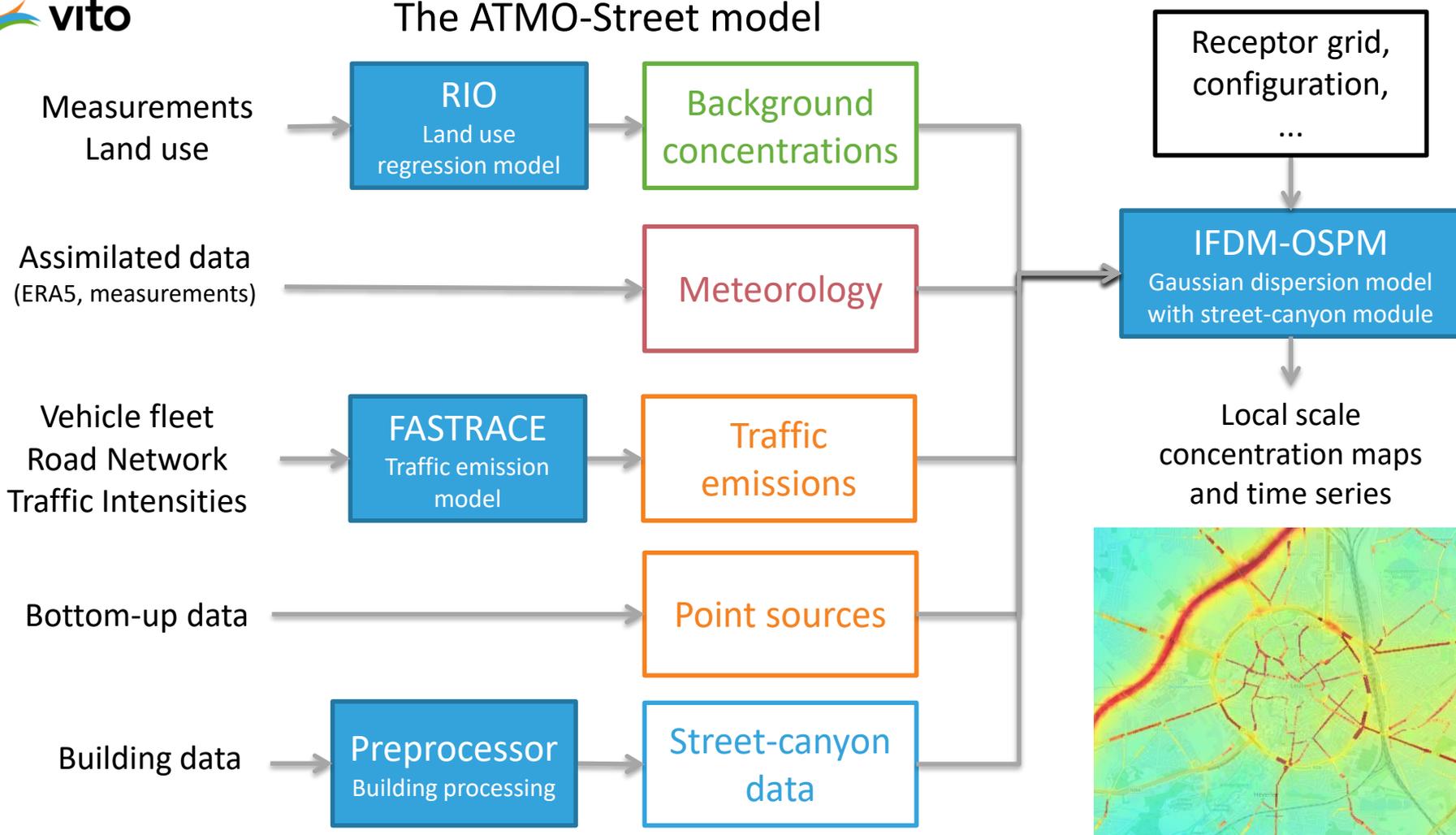
W. Lefebvre, H. Hooyberghs, S. de Craemer, S. Janssen, F. Fierens, E. Trimpeneers, F. Meysman

THE CURIUZE NEUZEN MEASUREMENT CAMPAIGN

- See previous talk (S. de Craemer)
- A large dataset of 4-weeks average NO_2 -concentrations
- Stringent data quality checks: 17886 measurements for validation



The ATMO-Street model

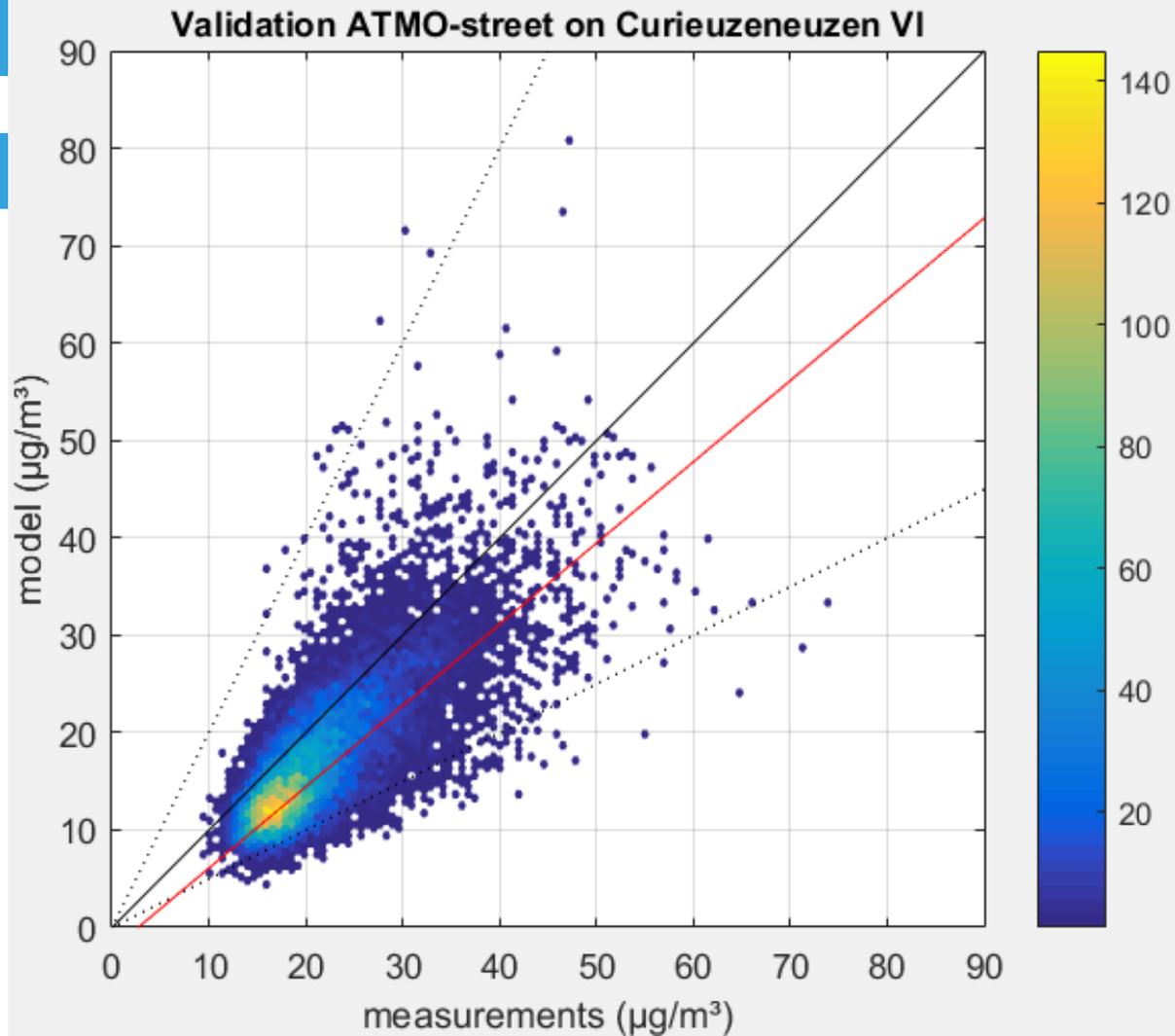


THE ATMO-STREET MODEL

- Previously validated on smaller dataset (e.g. Lefebvre et al., 2013)
- Never been validated on such a representative and large dataset

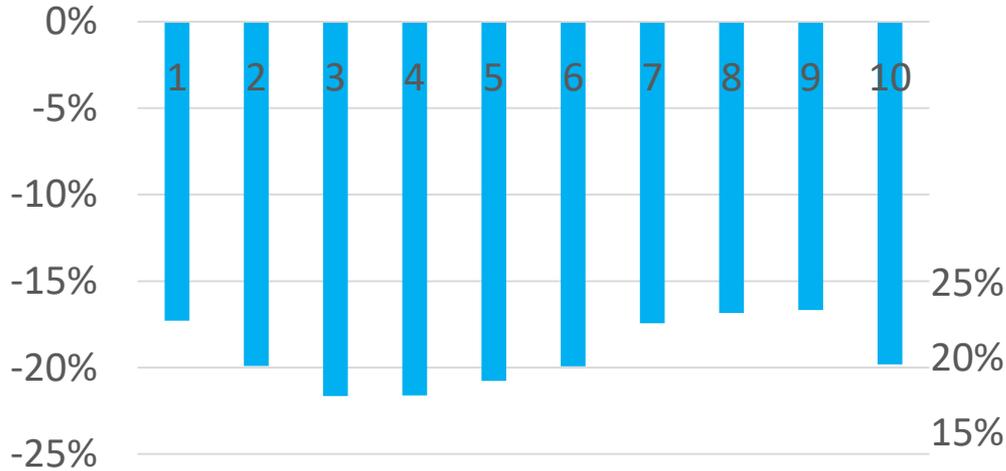
VALIDATION

Bias: $-4.07 \mu\text{g}/\text{m}^3$
 RMSE: $6.12 \mu\text{g}/\text{m}^3$
 BCRMSE: $4.57 \mu\text{g}/\text{m}^3$
 R^2 : 0.58
 MQI: 0.956

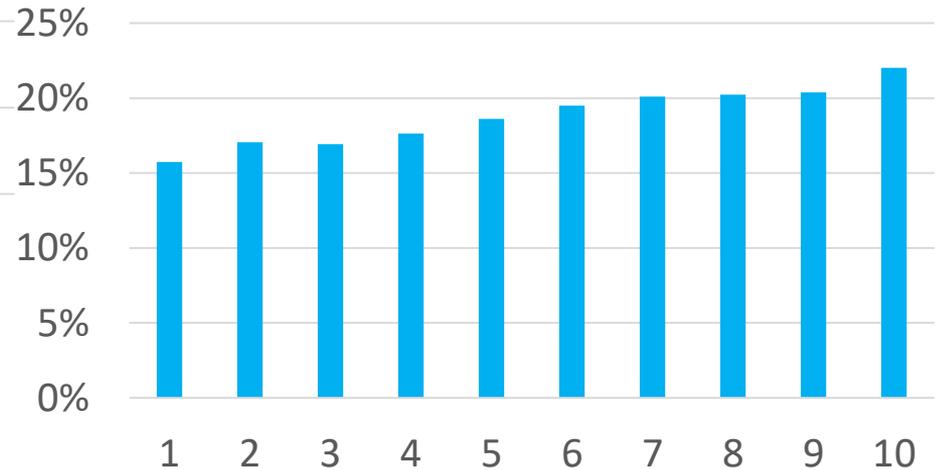


VALIDATION

Bias per decile (in %)

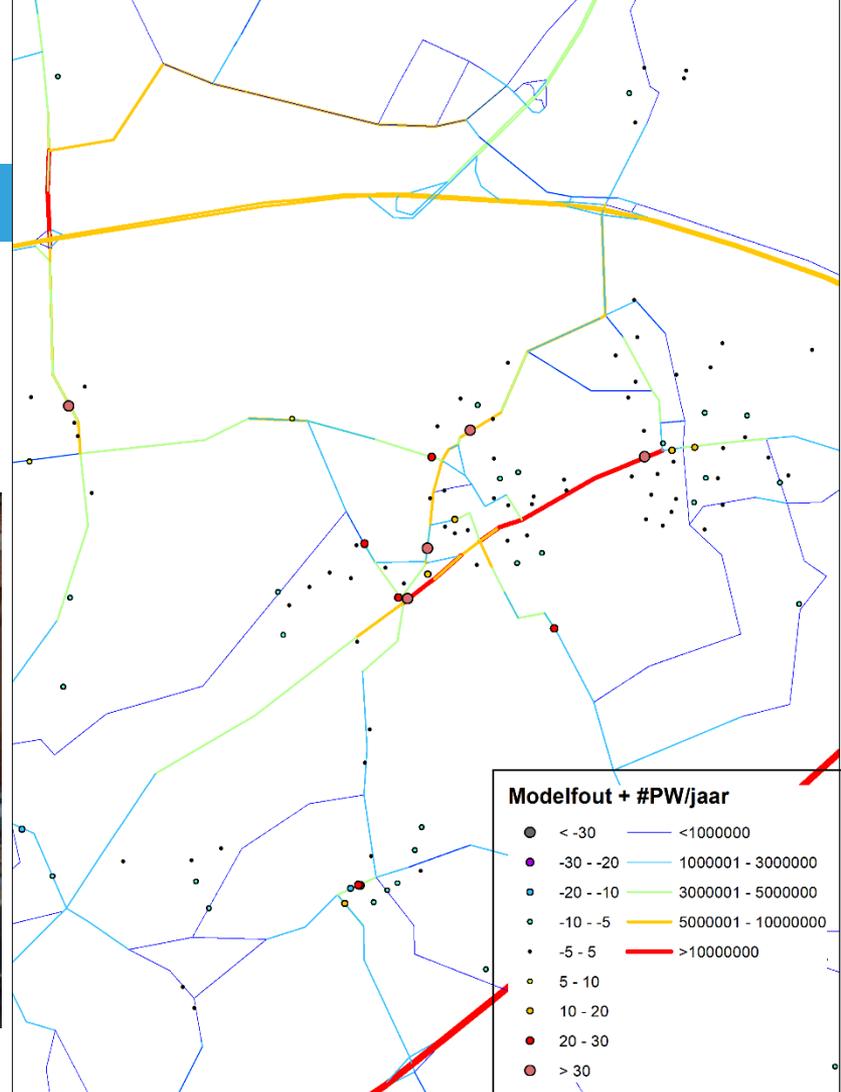


BCRMSE per decile (in %)



DETAILED INVESTIGATION OF ORIGIN OF ERRORS

- Traffic data!
 - At several locations, the traffic data is unrealistic. (Strong clustering of most important errors)



DETAILED INVESTIGATION OF ORIGIN OF ERRORS

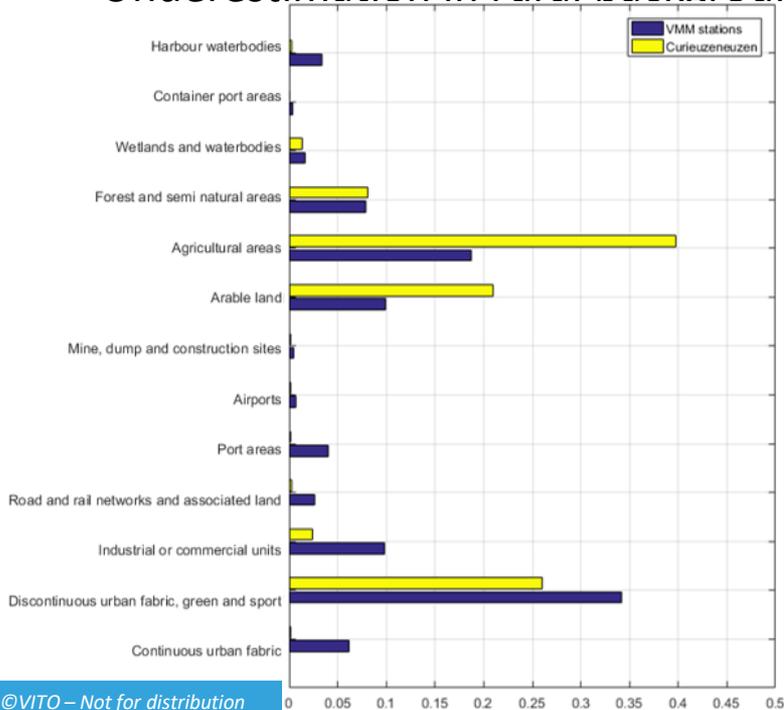
- Street canyon or not?
 - Ribbon development
 - Wide street canyons
 - Half-open canyons



DETAILED INVESTIGATION OF ORIGIN OF ERRORS

- Strong underestimations at the coast, close to the borders
- Underestimation in rural background locations

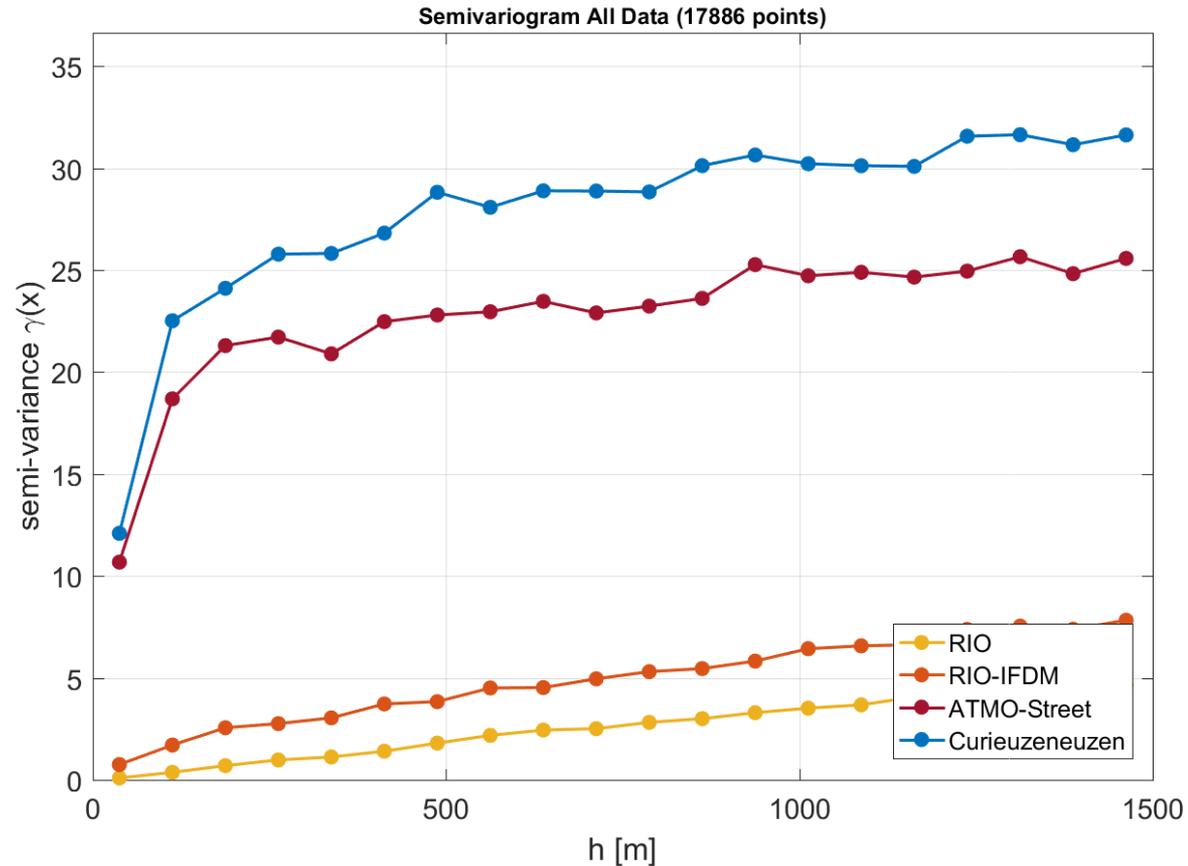
=> RIO adaptations



Improvement visible => still working on that

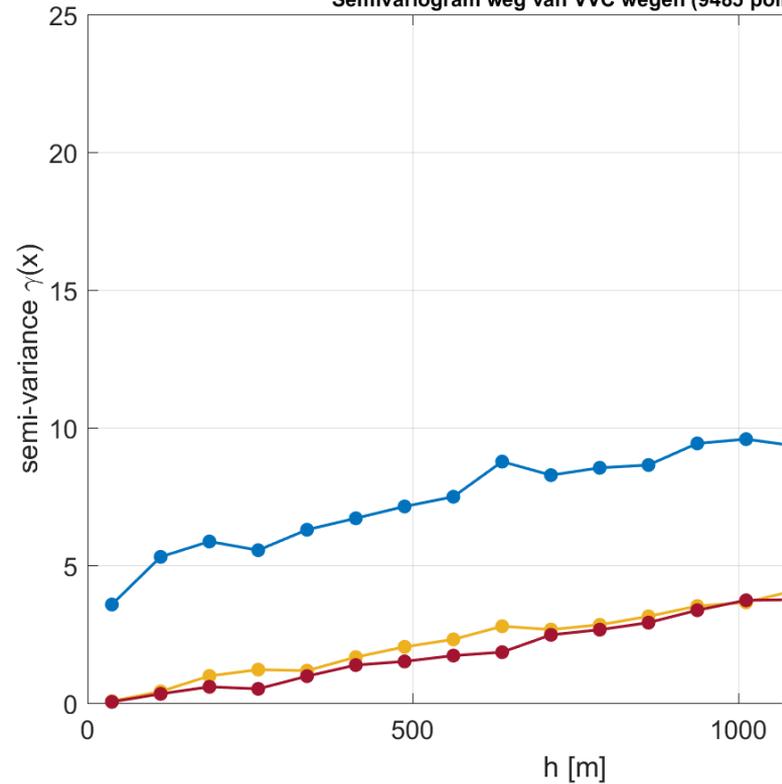
LOCAL SPATIAL VARIABILITY: SEMIVARIOGRAM

$$\gamma(h) = \frac{1}{2N(h)} \sum_{N(h)} (c_i - c_j)^2$$

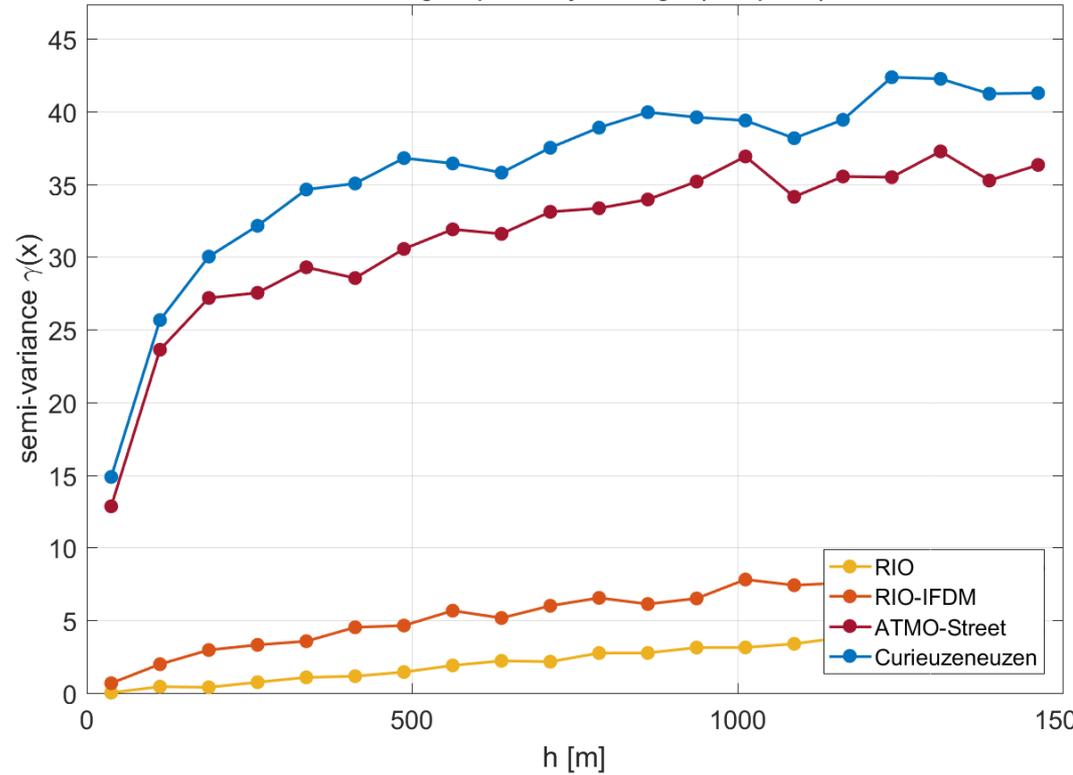


LOCAL SPATIAL VARIABILITY: SEMIVARIOGRAM

Semivariogram weg van VVC wegen (9485 poi)



Semivariogram punten bij VVC wegen (8401 points)



CONCLUSIONS

- The model validates well, although there is an important negative bias
- The measured spatial variation is well represented by the model
- Main improvements:
 - Traffic data
 - Edge street canyon cases
 - RIO-contribution