Can We Trust the Data?

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Target Performance Values Depend on Application

- Regulatory compliance (<10%)
- Spatial gradient studies (<25%)
- Intervention studies (<30%)
- Hot spot determination (<50%)
- Citizen science projects (<50%)

Data Quality Objectives

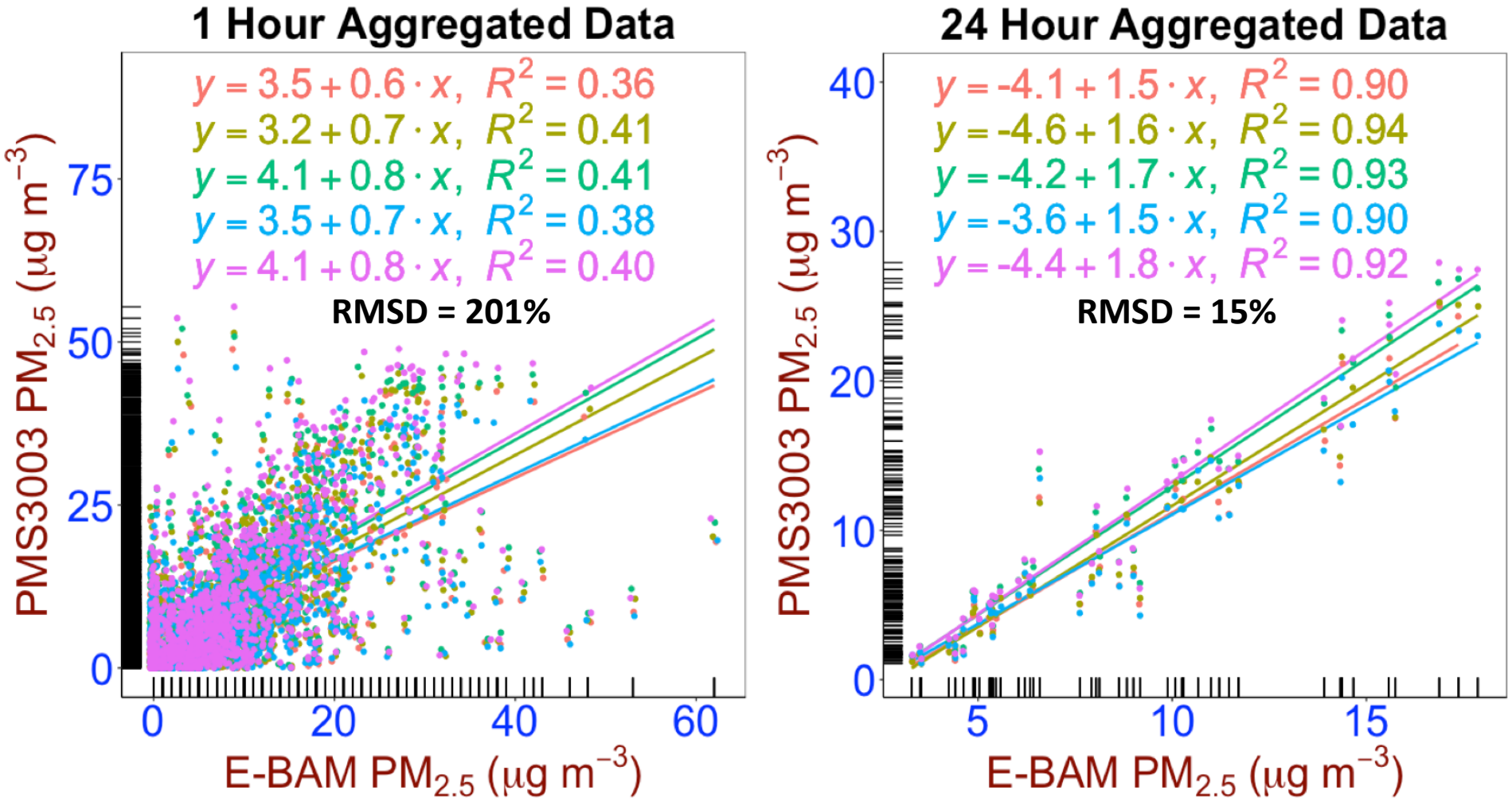
- Well defined measurement error for given concentration and averaging time
- Minimum sensor down time

Field Calibrations are Critical

- Nearly impossible to generate aerosol in lab with field relevant chemical, physical and optical properties
- Calibrations need to be conducted in field but several questions need to be addressed:

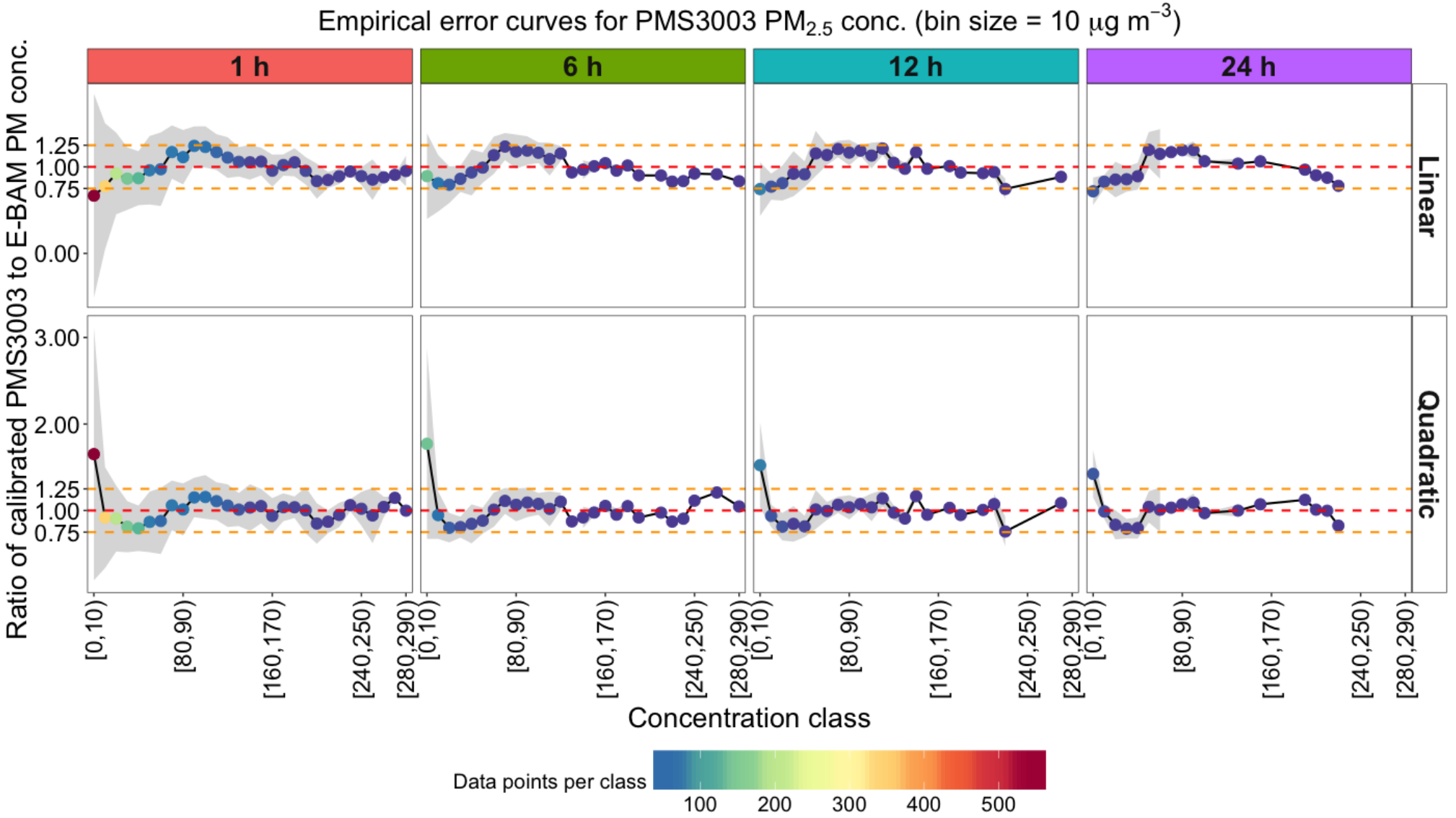
- What is the best calibration methodology (timescale, reference instrument)?
- How does variability in PM properties influence calibrations?
- How do other parameters (T, RH) impact calibrations?
- How does sensor performance change over time and how do calibrations change?

PM Sensor Comparison with EBAM (Low Concentration)



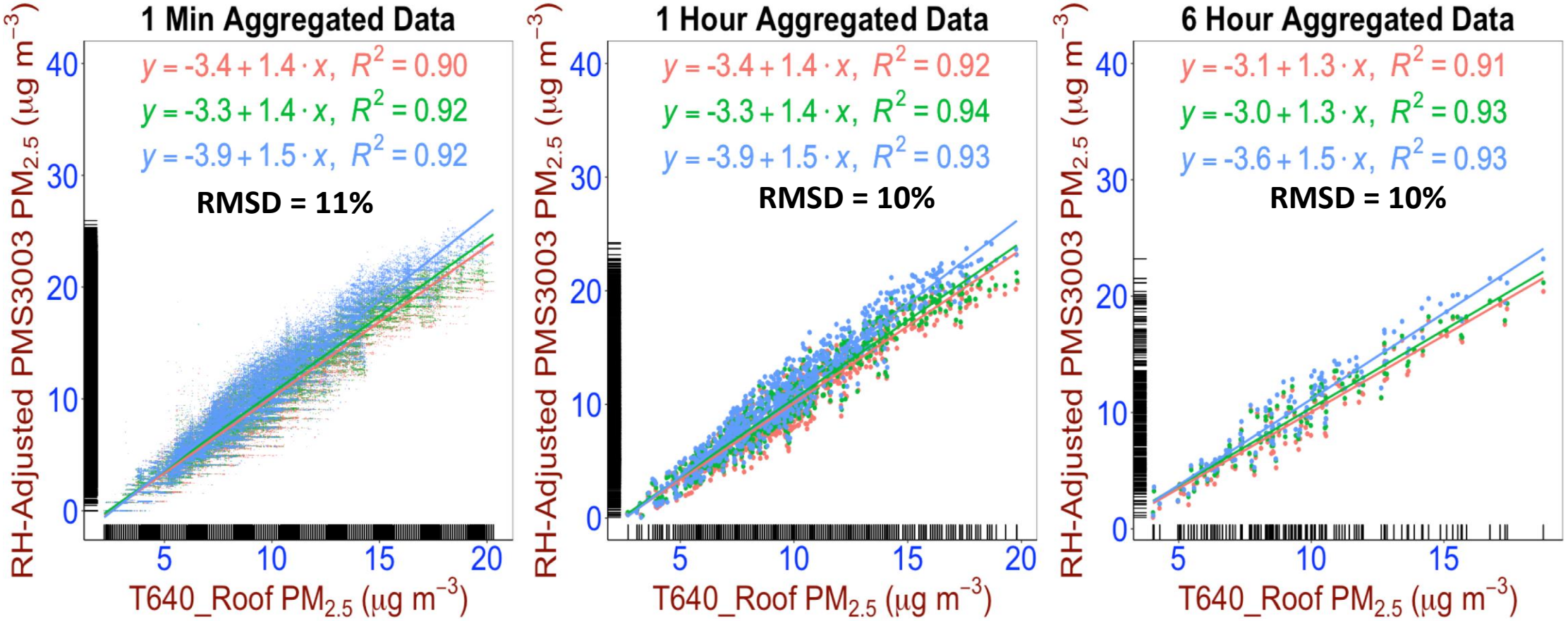
(Zheng et al., in review)

Measurement Errors with EBAM as Reference



(Zheng et al., in review)

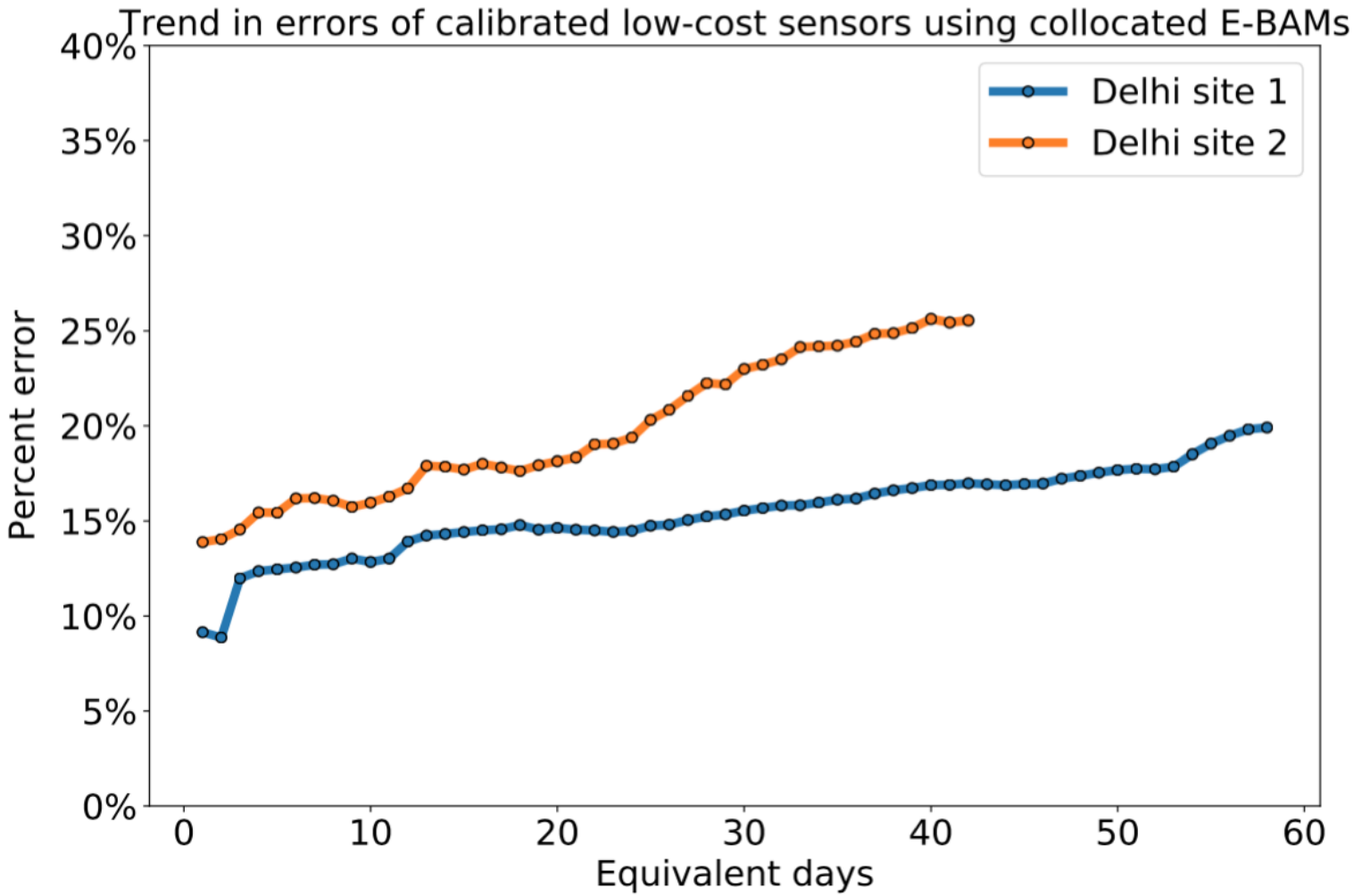
Using a Different Reference Monitor (T640) and Correcting for RH Influence



Note: with no RH correction RMSD ~ 25%

(Zheng et al., in review)

Sensor Error with Time: New Delhi ~100 μgm^{-3}



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