



kunak air PRO

CO-LOCATION FIELD STUDY

kunak
SENSING ANYWHERE

NO

Nitrogen monoxide

Gobierno de Navarra
Nafarroako Gobernua
2030

- **INSTALLATION:** On top of AQS (3-4meters)
- **STABILIZATION TIME:** 2 days
- **CALIBRATION PROCEDURE:** None
- **POST-PROCESSING:** None. Real corrected data is calculated directly in the device without any delay. No re-calibrations or corrections are applied during the field tests unless specified. Then, the initial calibration is maintained during the whole field tests and results shown in this study.
- **SAMPLING PERIOD:** data is averaged every hour to match data from reference station.
- **100%** of KUNAKAIR data is used for analysis, therefore, any possible outlier is included in the statistics.
- **VALIDATION:** statistics are only calculated if valid Reference Data is available.

- **ACCURACY:** is obtained as the mean absolute error (MAE) between KUNAKAIR measurements and the reference instruments.
- **90% CONFIDENCE INTERVAL:** the 90% of the measurements are below this error. Also, the relative error of the maximum error in the 90% of measurements is shown.
- **RELATIVE EXPANDED UNCERTAINTY:**

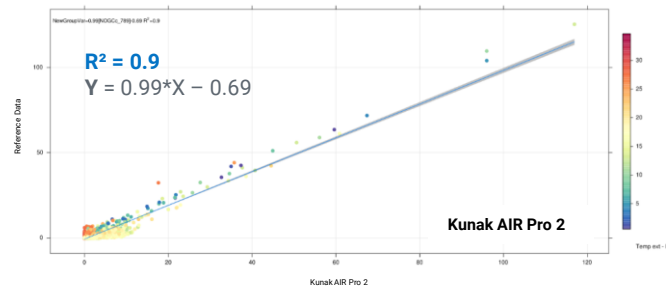
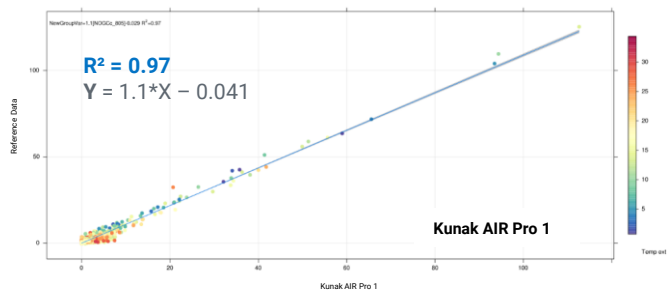
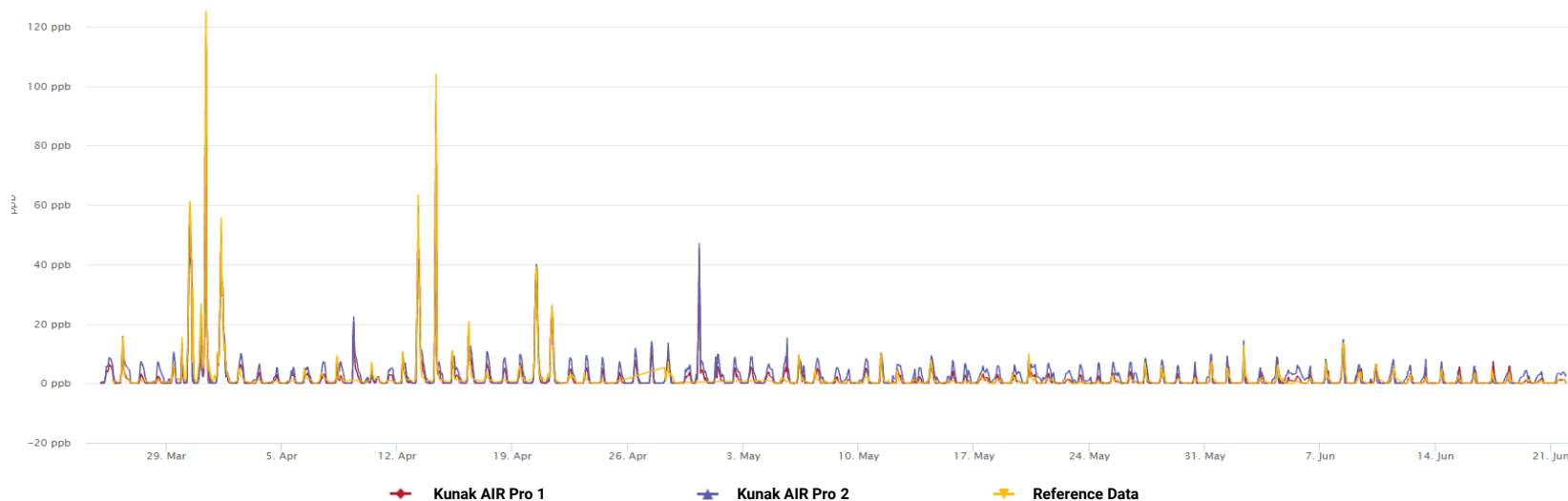
$$U(\text{exp}) = k * \sqrt{\left(\frac{\text{RSS}}{n-2} - u(bs, RM)^2\right) + [a + (b - 1) * L]^2}$$

- **DATA QUALITY OBJECTIVE (DQO):** concentration value from which DQO defined in the EU Air Quality Directive (2008/50/EC) is met. Also, it is shown the DQ obtained for the Limit Values set in EU directive for indicative measurements.
- **AVAILABILITY:** is defined as the number of 1 hour averaged samples sent by the device/number of hours in the month.
- Results also include the average concentrations (AVG. GC) during the whole tests.
- **Temporal plots, Scatter plots, DQO plot and Time Variation of the Mean** are used to analyze the test results.
- **FIELD TEST MAIN OBJECTIVES:**
 1. Check the performance of KUNAKAIR V3 device vs. Reference equipment over time, obtaining the statistics defined previously during autumn, winter and spring time.

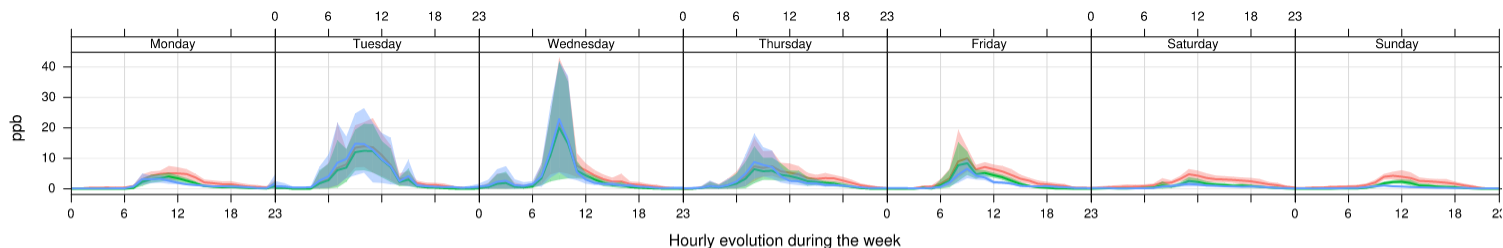
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Nitrogen monoxide

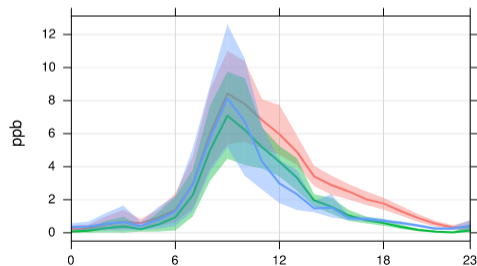
NITROGEN MONOXIDE (NO), Lille (France) - MAR'21 – JUN'21



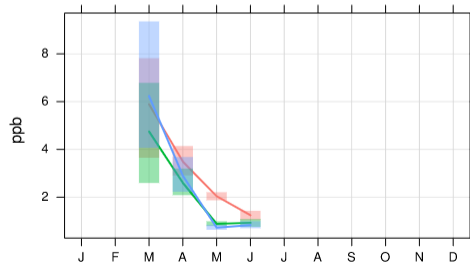
NITROGEN MONOXIDE (NO), Lille (France) - MAR'21 – JUN'21



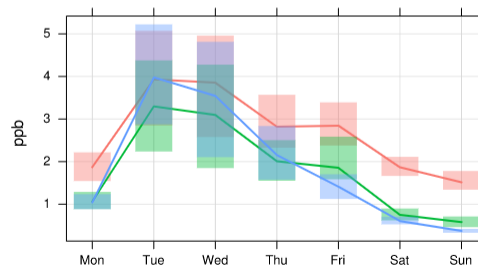
■ Kunak AIR Pro 1
 ■ Kunak AIR Pro 2
 ■ Reference Data



Hourly evolution



Monthly evolution
Mean and 95% confidence interval in mean



Evolution by days of the week

UNIT	R ²	ACCY. (PPB)	90% CONF. (PPB)	U(exp)/U(exp) cal (<25%)	N > LV (160 ppb)	AVG. GC. DUT (PPB)	AVG. GC. REF (PPB)
AIR Pro 1	0.97	0.79	1.96	17.98%	0	1.80	1.84
AIR Pro 2	0.90	1.48	4.03	4.54%	0	2.67	1.84

Want to know more?

Contact us!



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