Visibilis

Citizen Science Project @DCMR Berghaven

André van der Wiel & Dieter Pientka

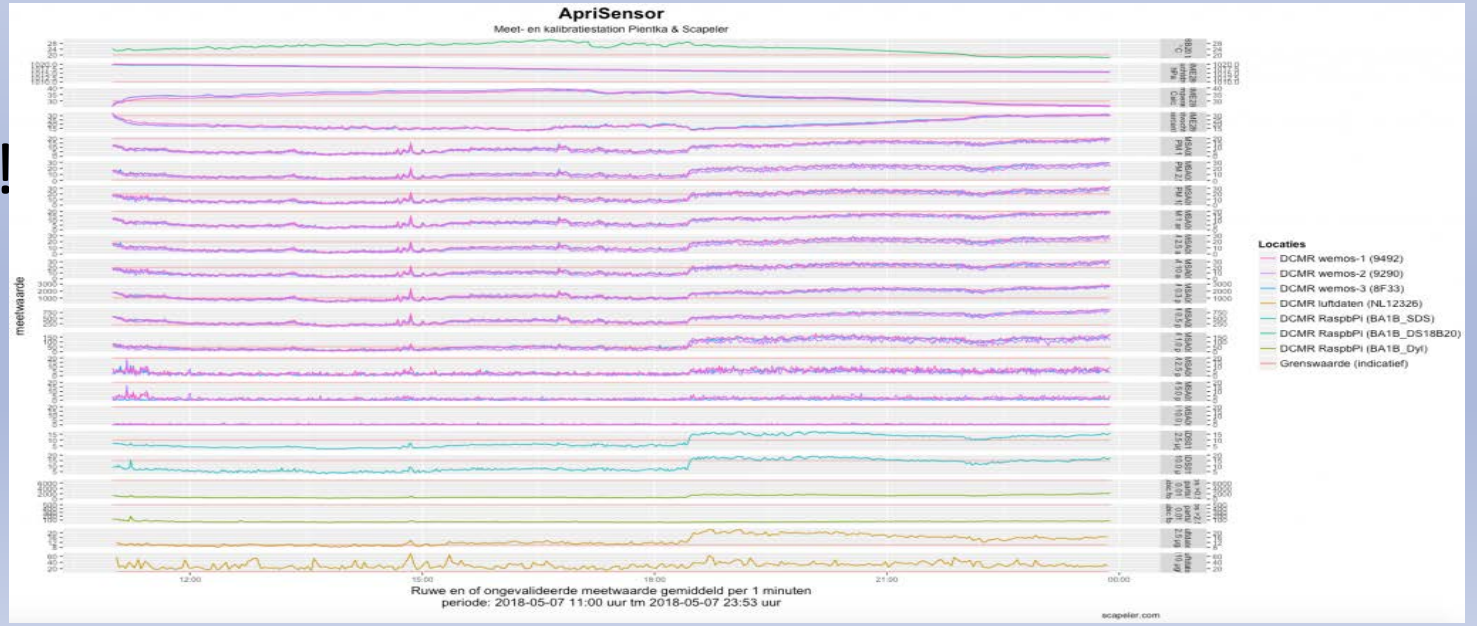
Installatie op 7 mei 2018

De sensorkoffer

Meer info? : www.scapeler.com Scapeler

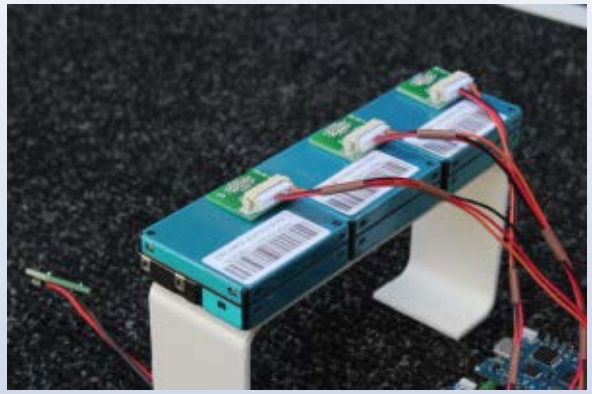
Doel Project

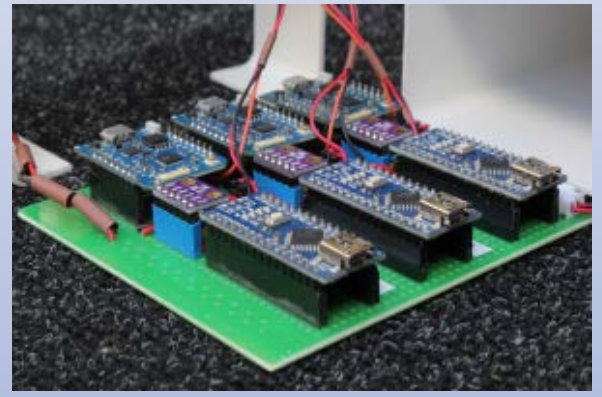
- Focus op Fijn stof PM2.5
- Onderlinge samenhang sensoren
- Prestaties op langere termijn
- Kalibratie/Validatie sensoren tegen de BAM1020 (o.b.v uurdata)
- Invloed van T en RH%
- Opbouwen Kennis & Kunde!

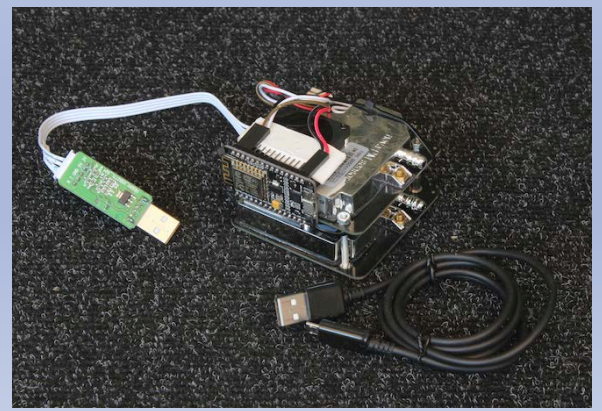


De Sensoren & Hardware

- Dylos DC1100 Pro
- Nova SDS011 & SDS011 Luftdaten
- 3x Plantower PMSA003
- 3x Bosch BME280 Meteo **in** koffer (T, RH% en Pl)
- Dallas DS18B20 externe T sensor **buiten** koffer
- Raspberry Pi centrale processor + extra Ventilator







Tussentijdse Resultaten

- Keuze PMSA003 sensor voor kalibratie o.b.v statistisch onderzoek
- BME280 sensoren zijn gelijkwaardig
- Kalibratie via MLR (Multiple Linear Regression)
- Validatie met onafhankelijke data

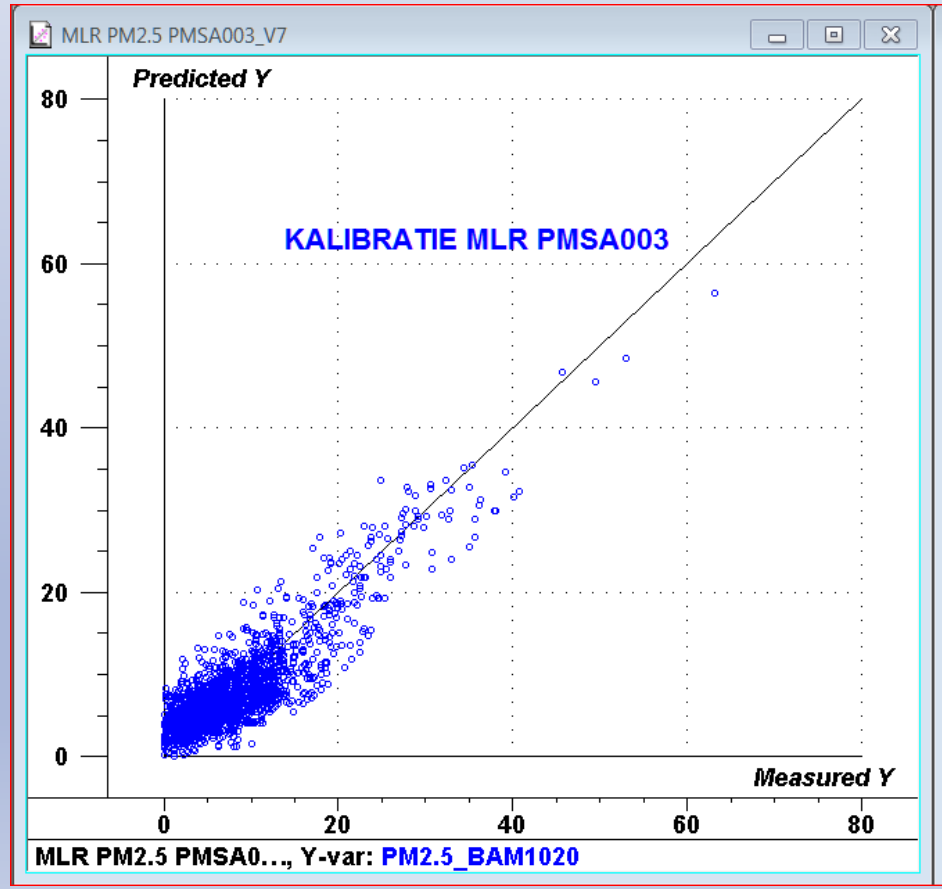
- Concept MLR model:

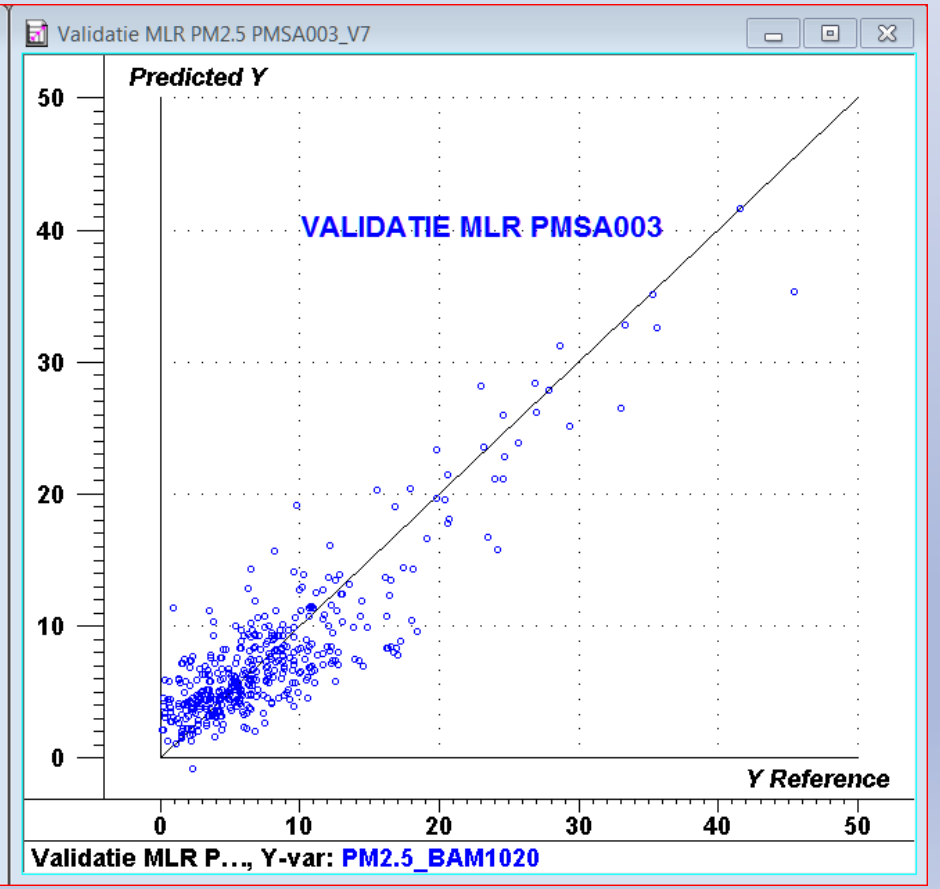
PM2.5_BAM1020 = constante + (A*PM2.5_Sensor) + (B*Temp_BME280) + (C*RH%_BME280)

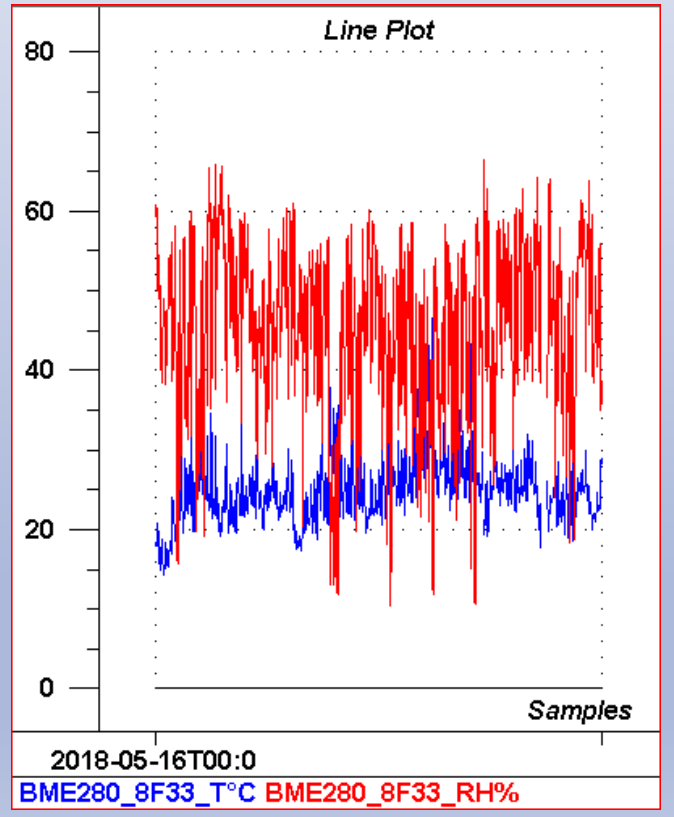
Prestaties MLR modellen PM2.5 (16 mei t/m 9 September)

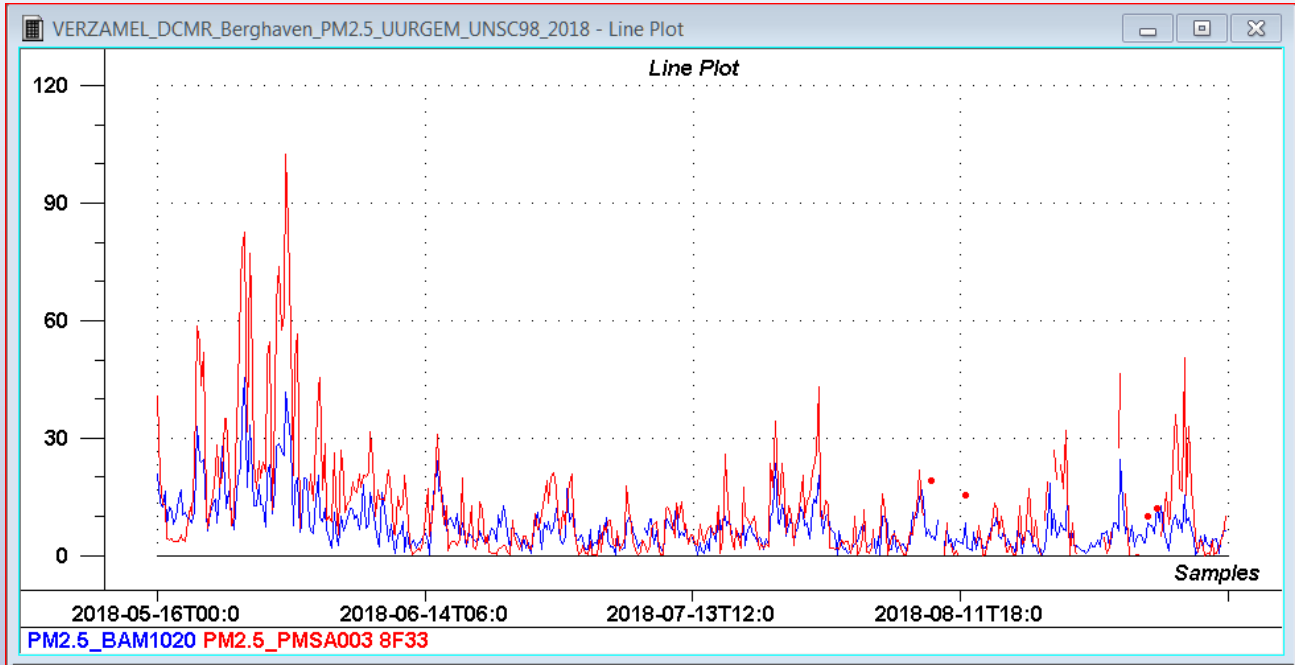
Sensor (Calibratie)	Aantal uren	Slope	R^2	Fout model (µg/m3)	Sensor (Validatie)	Aantal uren	Slope	Offset (µg/m3)	R^2	Fout model (µg/m3)
PMSA003	2076 (#)	0.771	0.770	3.1	PMSA003	419 (#)	0.772	1.7	0.776	3.1
SDS011	2286	0.712	0.711	3.5	SDS011	456	0.724	2.1	0.730	3.3
Dylos DC1100	2169	0.626	0.624	3.5	Dylos DC1100	449	0.554	3.1	0.578	4.3

Uitval door storing insect





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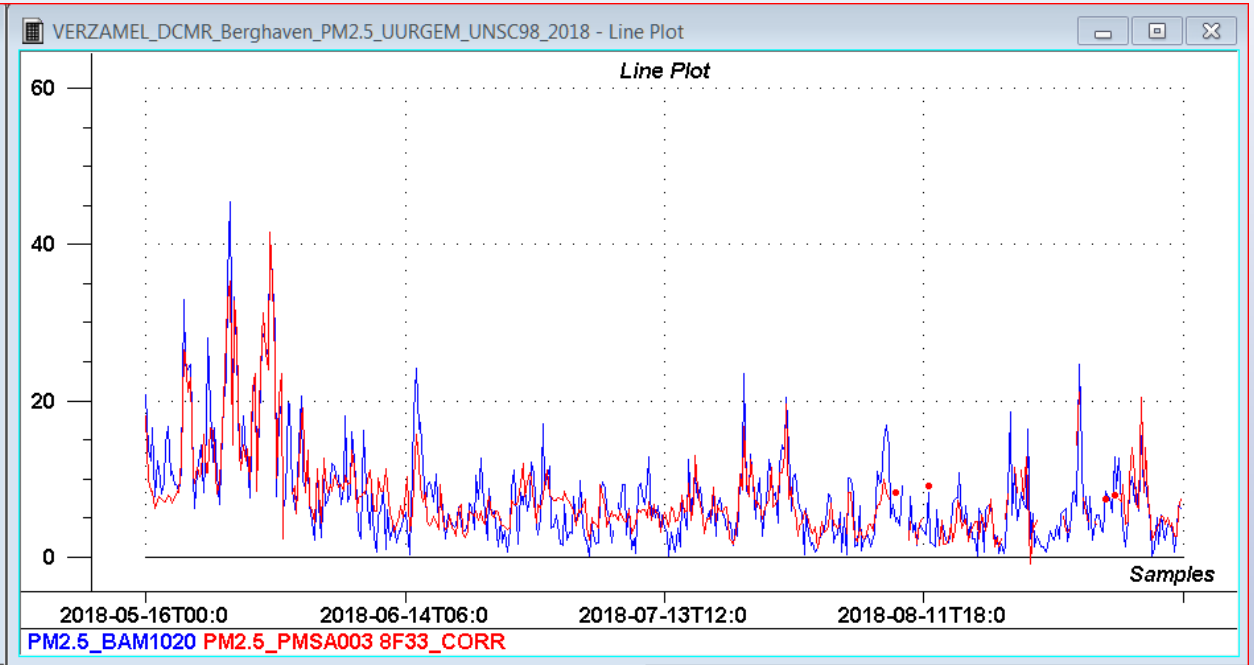
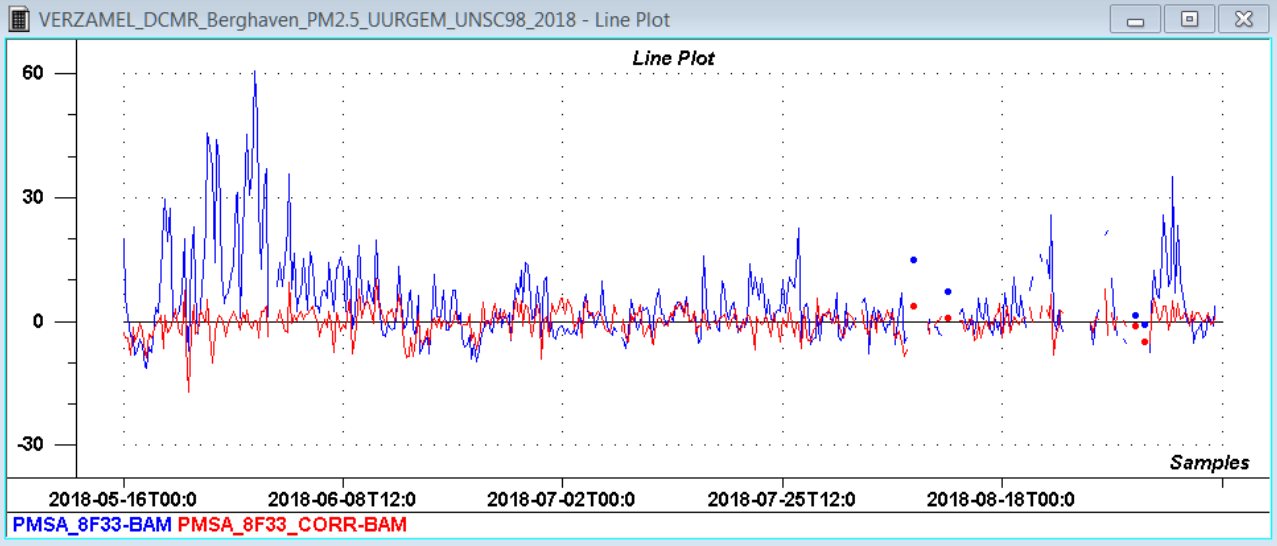
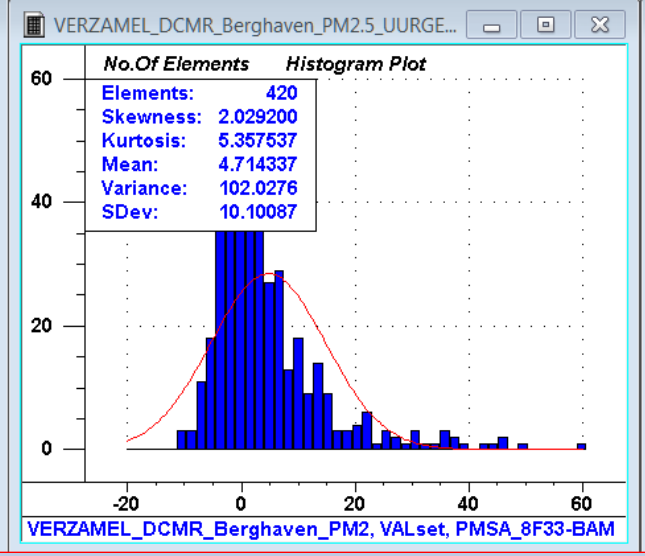
Line Plot
120
90
60
30
0
Samples
2018-05-16T00:0
2018-06-14T06:0
2018-07-13T12:0
2018-08-11T18:0
PM2.5_BAM1020 PM2.5_PMSA003 8F33


VERZAMEL_DCMR_Berghaven_PM2.5_UURGEM_UNSC98_2018 - Line Plot
Line Plot
60
40
20
0
Samples
2018-05-16T00:0
2018-06-14T06:0
2018-07-13T12:0
2018-08-11T18:0
PM2.5_BAM1020 PM2.5_PMSA003 8F33_CORR


VERZAMEL_DCMR_Berghaven_PM2.5_UURGEM_UNSC98_2018 - Line Plot
Line Plot
60
30
0
-30
Samples
2018-05-16T00:0
2018-06-08T12:0
2018-07-02T00:0
2018-07-25T12:0
2018-08-18T00:0
PMSA_8F33-BAM PMSA_8F33_CORR-BAM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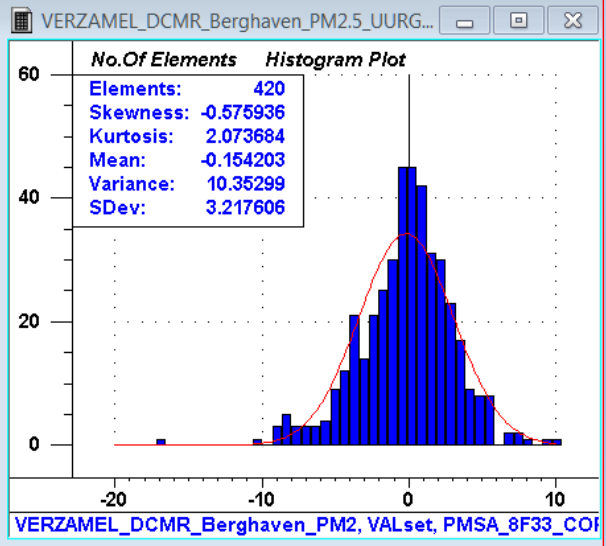
No.Of Elements Histogram Plot
Elements: 420
Skewness: 2.029200
Kurtosis: 5.357537
Mean: 4.714337
Variance: 102.0276
SDev: 10.10087
60
40
20
0
-20
0
20
40
60
VERZAMEL_DCMR_Berghaven_PM2, VALset, PMSA_8F33-BAM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Skewness: -0.575936
Kurtosis: 2.073684
Mean: -0.154203
Variance: 10.35299
SDev: 3.217606
60
40
20
0
-20
-10
0
10
VERZAMEL_DCMR_Berghaven_PM2, VALset, PMSA_8F33_COR

Aandachtspunten

- Meer range in de variabelen
- Reproduceerbaarheid BAM1020
- Minimum detectie BAM1020
- MLR voor PMSA003 o.b.v. ruwe (deeltjes) data
- Ontwikkelen ondersteunende web software op basis van Shiny-server
- Voortgang “Visibilis” via blogs op www.scapeler.com!