UVP5-UVP6 intercalibration

Version 2020/05/04

Selection of reference instrument and data

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---------------------------------------------------------
----------- Base list --------------------------------
1 database in W:\uvp6_sn000008lp_20220127_intercalibrage\results\
N°= 1 : baseuvp6_sn000008lp_20220127_intercalibrage.mat
Selected database : baseuvp6_sn000008lp_20220127_intercalibrage.mat
Number : 1   >  Profile : 20220127-083711_sample_1
Number : 2   >  Profile : 20220127-094120_sample_2
Number : 3   >  Profile : 20220127-101424_sample_3
Number : 4   >  Profile : 20220127-105523_sample_4
Number : 5   >  Profile : 20220127-113732_sample_5
Number : 6   >  Profile : 20220127-115628_sample_6
Number : 7   >  Profile : sum_sample_1_sample_2_sample_3_sample_4_sample_5_sample_6
---------------------------------------------------------
----------- Base list --------------------------------
1 database in W:\uvp6_sn000009lp_20220127_intercalibrage\results\
N°= 1 : baseuvp6_sn000009lp_20220127_intercalibrage.mat
Selected database : baseuvp6_sn000009lp_20220127_intercalibrage.mat
Number : 1   >  Profile : 20220127-083752_sample_1
Number : 2   >  Profile : 20220127-094235_sample_2
Number : 3   >  Profile : 20220127-101410_sample_3
Number : 4   >  Profile : 20220127-105537_sample_4
Number : 5   >  Profile : 20220127-113721_sample_5
Number : 6   >  Profile : 20220127-115617_sample_6
Number : 7   >  Profile : sum_sample_1_sample_2_sample_3_sample_4_sample_5_sample_6
---------------------------------------------------------
----------- Base list --------------------------------
1 database in W:\uvp6_sn000010lp_20220127_intercalibrage\results\
N°= 1 : baseuvp6_sn000010lp_20220127_intercalibrage.mat
Selected database : baseuvp6_sn000010lp_20220127_intercalibrage.mat
Number : 1   >  Profile : 20220127-083727_sample_1
Number : 2   >  Profile : 20220127-094135_sample_2
Number : 3   >  Profile : 20220127-101436_sample_3
Number : 4   >  Profile : 20220127-105519_sample_4
Number : 5   >  Profile : 20220127-113751_sample_5
Number : 6   >  Profile : 20220127-115601_sample_6
Number : 7   >  Profile : sum_sample_1_sample_2_sample_3_sample_4_sample_5_sample_6
```

Selection of instrument data to adjust

```
---------------------------------------------------------
----------- Base list --------------------------------
1 database in W:\uvp6_sn000158hf_20220127_intercalibrage\results\
N°= 1 : baseuvp6_sn000158hf_20220127_intercalibrage.mat
Selected database : baseuvp6_sn000158hf_20220127_intercalibrage.mat
Number : 1   >  Profile : 20220127-084202_sample_1
Number : 2   >  Profile : 20220127-084202_017_sample_2
Number : 3   >  Profile : 20220127-084202_018_sample_3
Number : 4   >  Profile : 20220127-084202_019_sample_4
Number : 5   >  Profile : 20220127-084202_020_sample_5
Number : 6   >  Profile : 20220127-084202_021_sample_6
Number : 7   >  Profile : 20220127-084202_022_sample_7
Number : 8   >  Profile : 20220127-084202_023_sample_8
Number : 9   >  Profile : 20220127-084202_024_sample_9
Number : 10  >  Profile : 20220127-084202_025_sample_10
Number : 11  >  Profile : 20220127-094136_sample_11
Number : 12  >  Profile : 20220127-094136_017_sample_12
```
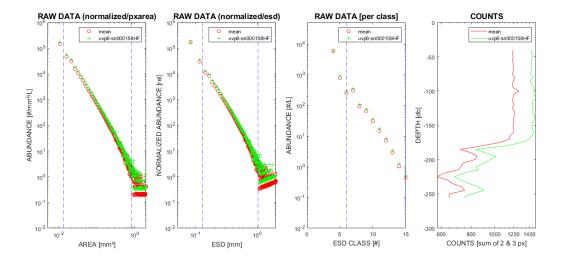
```
Number : 13   >   Profile : 20220127-094136_018_sample_13
Number : 14   >   Profile : 20220127-094136_019_sample_14
Number : 15   >   Profile : 20220127-094136_020_sample_15
Number : 16   >   Profile : 20220127-094136_021_sample_16
Number : 17   >   Profile : 20220127-094136_022_sample_17
Number : 18   >   Profile : 20220127-094136_023_sample_18
Number : 19   >   Profile : 20220127-094136_024_sample_19
Number : 20   >   Profile : 20220127-094136_025_sample_20
Number : 21   >   Profile : 20220127-101410_sample_21
Number : 22   >   Profile : 20220127-101410_017_sample_22
Number : 23   >   Profile : 20220127-101410_018_sample_23
Number : 24   >   Profile : 20220127-101410_019_sample_24
Number : 25   >   Profile : 20220127-101410_020_sample_25
Number : 26   >   Profile : 20220127-101410_021_sample_26
Number : 27   >   Profile : 20220127-101410_022_sample_27
Number : 28   >   Profile : 20220127-101410_023_sample_28
Number : 29   >   Profile : 20220127-101410_024_sample_29
Number : 30   >   Profile : 20220127-101410_025_sample_30
```
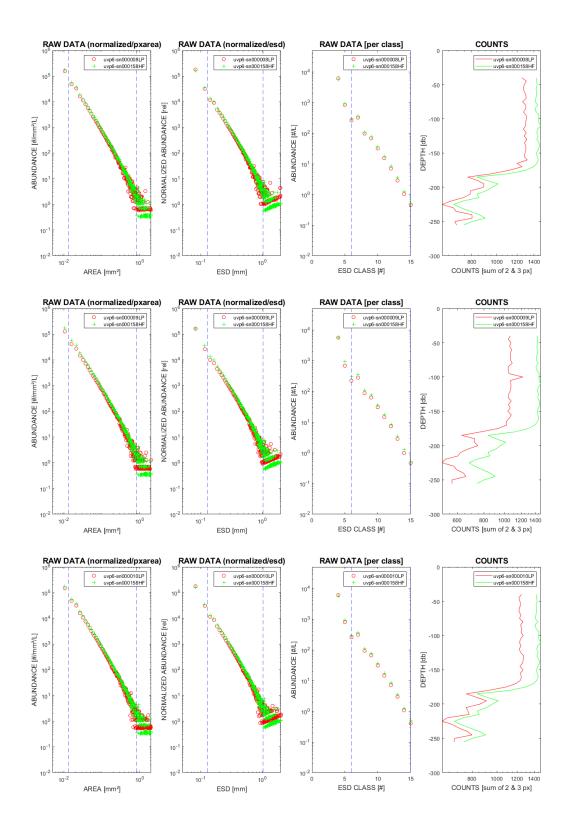
Raw data graphs

Graphs of the mean abundance of the particles counted by the reference UVPs (red) compared with the abundance of particles counted by the UVP being adjusted (green).

The particle size is calculated using the raw pixel size.

The blue dashed vertical lines indicate the size limit for the calibration process.
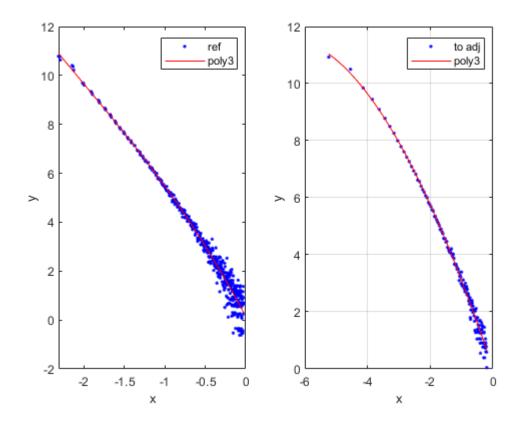


```
Same graphs but for each reference uvp taken independently
The particle size is calculated using the raw pixels size.
```

Fit graphs

Fit of each abundance spectra.

The fits are used for the adjustement through the optimization of the calibration parameters.

Calibrated graphs
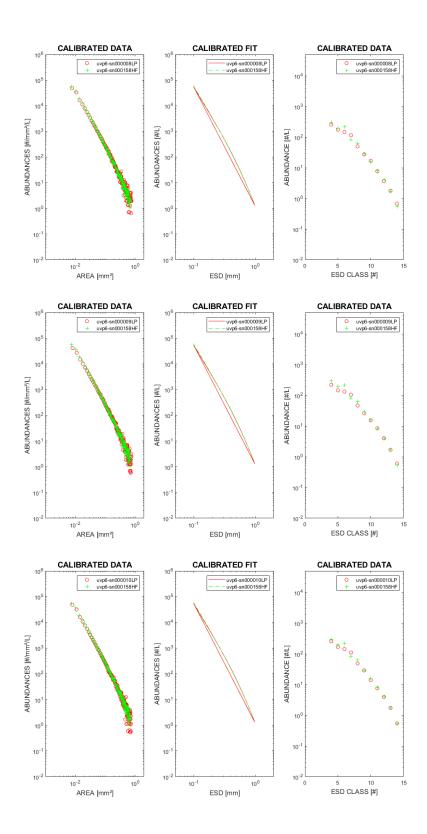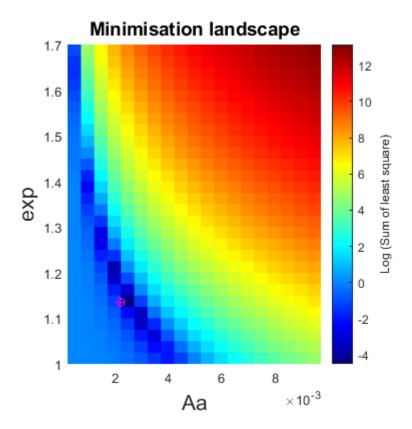
Graphs of the abundance of the particles counted by each reference UVP (red) compared with the abundance of particles counted by the UVP being adjusted (green).

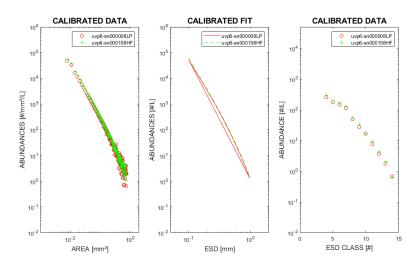The particle size is based on the calibrated size (ESD = 2(Area/PI)^0.5) where Area is the number of pixels.

The red FIT in the graph of the final adjustments is the average of all reference UVPs.

Minimisation landscape
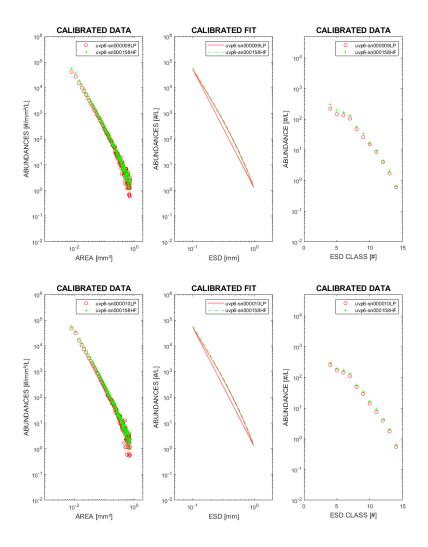
Minimisation landscape

Calibrated graphs for set aa and exp

Final results

```
------------------------------------------------------------------------
Processing date    : 2022-02-04 10:14:03
Processing operator : Alice Pierret
------------------------------------------------------------------------
Nb of reference uvps: 3
Min raw ESD   [mm]  : 0.13
Max raw ESD   [mm]  : 1.03
Mnimisation start   : [0.0029309 1.1]
Fit                 : poly3
Ratio (after adjust): 1.0091
EC (score)          : 0.0009244
Aa adjusted         : 2189
Exp adjusted        : 1.1352
Set EC (score)      : 0.022898
Set Aa              : 2300
Set Exp             : 1.1359
------------------------------------------------------------------------
Shutter             : 88
Gain                : 6
Threshold           : 22
Threshold target    : [20:22]
Score target        : < 0.04
Aa adjusted desired : [1900:2555]
Exp adjusted desired: [1.10:1.20]
```

```
------------------------------------------------------------------------
Reference UVP         : uvp6-sn000008LP
Light 1               : 000008VE
Light 2               :
Reference folder      : uvp6_sn000008lp_20220127_intercalibrage
Reference profile     : 20220127-083711_sample_1
Reference profile #  : 1
Observed volume [L]  : 278.4
Shutter               : 301
Gain                  : 6
Threshold             : 20
Exposure              : 301
SMBase                : 1
Image volume [L]      : 0.6
Pixel        [mm]     : 0.073
Pixel Area   [mm²]    : 0.005329
Aa                    : 2167
Exp                   : 1.159
------------------------------------------------------------------------
Reference UVP         : uvp6-sn000009LP
Light 1               : 000122VE
Light 2               :
Reference folder      : uvp6_sn000009lp_20220127_intercalibrage
Reference profile     : 20220127-083752_sample_1
Reference profile #  : 1
Observed volume [L]  : 291.58
Shutter               : 416
Gain                  : 6
Threshold             : 20
Exposure              : 416
SMBase                : 1
Image volume [L]      : 0.61
Pixel        [mm]     : 0.073
Pixel Area   [mm²]    : 0.005329
Aa                    : 2302
Exp                   : 1.144
------------------------------------------------------------------------
Reference UVP         : uvp6-sn000010LP
Light 1               : 000010VE
Light 2               :
Reference folder      : uvp6_sn000010lp_20220127_intercalibrage
Reference profile     : 20220127-083727_sample_1
Reference profile #  : 1
Observed volume [L]  : 318.12
Shutter               : 354
Gain                  : 6
Threshold             : 20
Exposure              : 354
SMBase                : 1
Image volume [L]      : 0.66
Pixel        [mm]     : 0.073
Pixel Area   [mm²]    : 0.005329
Aa                    : 2271
Exp                   : 1.143
------------------------------------------------------------------------
Adjusted UVP          : uvp6-sn000158HF
Light 1               : 000155VE2
Light 2               :
Adjusted folder       : uvp6_sn000158hf_20220127_intercalibrage
Adjusted profile      : 20220127-084202_022_sample_7
Adjusted profile #   : 7
Observed volume [L]  : 516.12
Shutter               : 88
Gain                  : 6
```

```
Threshold        : 22
Exposure         : 88
SMBase           : 1
Image volume [L]    : 0.69
Pixel      [mm]     : 0.073
Pixel Area   [mm²]  : 0.005329
Aa               : 2300
Exp              : 1.1359
------------------------------------------------------------------------
```