AcouSed - unsaved file

File Tools Help

7

Open

Acoustic data | Signal preprocessing | Sample data | Sediment Calibration | Acoustic inversion | Note

Acoustic recording

Download file

1

AQUAscat

2

20240703111300.aqa

Acoustic Backscatter System: AQUAscat | AQUAscat Rc

3

Date: 2024-07-03 Hour: 11:13:00

Distance from ABS to free surface 0.00 m

Temperature : 4 10 °C

Speed of sound : 1447.28 m/s

Table of values

	Time - 0.3 MHz	Depth - 0.3 MHz	BS - 0.3 MH
0	0.00	0.01	3.85e-03
1	0.00	0.01	2.26e-03
2	0.00	0.01	2.51e-02
3	0.00	0.02	2.20e-03
4	0.00	0.03	5.44e-01
5	0.00	0.03	8.55e-01
6	0.00	0.04	8.84e-01
7	0.00	0.04	5.23e-01
8	0.00	0.04	8.03e-01

Display option

Convert recording time to distance from bank

Value Distance : m / record

GPS file $T_{acoustic} = T_{GPS}$ + sec

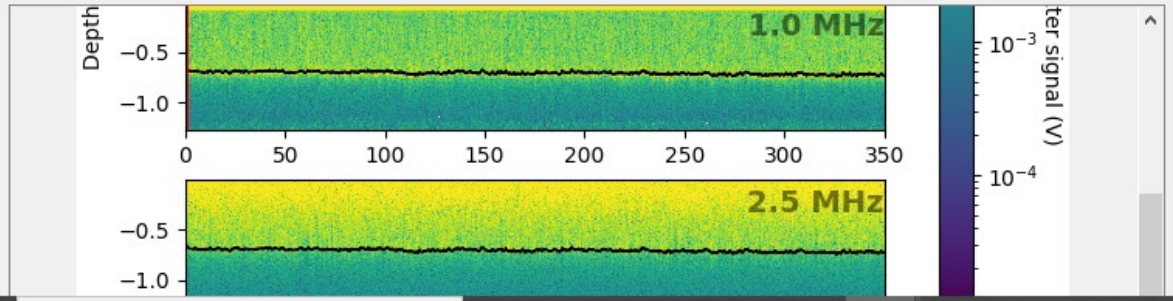
Set the boundaries

	min	limit -->	<-- limit	max	unit
Depth	-1.28	-1.28	-0.005	-0.005	meters
Recording time	0.0	0.0	350 5	456.1	seconds
Distance from bank	0.00	0.00	0.00	0.00	meters

Detect bottom of the river

0.3 MHz From -0.8 m 6 to -0.5 m +/- 0.01 m

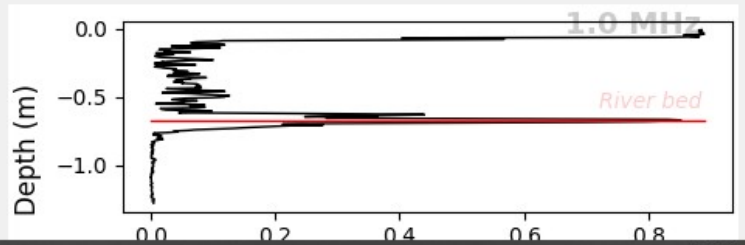
Raw acoustic data 2D field



Plot the vertical profile for one frequency

1.0 MHz

x=0.394 y=−0.56



Type here to search

ALERTE INFO FRA 12:57 20/03/2025

- Step 1
  Select *AQUAscat*
- Step 2
  Click on green cross button and select file *20240703111300.aqa*
- Step 3
  Select *AQUAscat Romanche 2024*
- Step 4
  Set the temperature to 10°C and press Enter
- Step 5
  Set the upper limit to 350 sec and press green arrow button (on the same line)
- Step 6
  Select 0,3 MHz and set -0,8 m and -0,5 m for, respectively, the interval start and end of the first interrogation area.
  Set 0,01 m for the next interrogation area gap
- Step 7
  File → Export → Table of Backscatter values
  Select a folder. Data are record in a csv file with the default name *Table_20240703111300.csv (Table_*acoustic file name*.csv)*

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Study data

Data to be processed

20240703111300.aqa

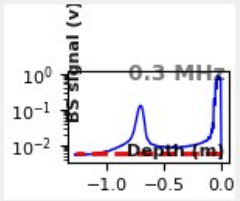
1

Plot noise field

Noise file

2

Profile tail



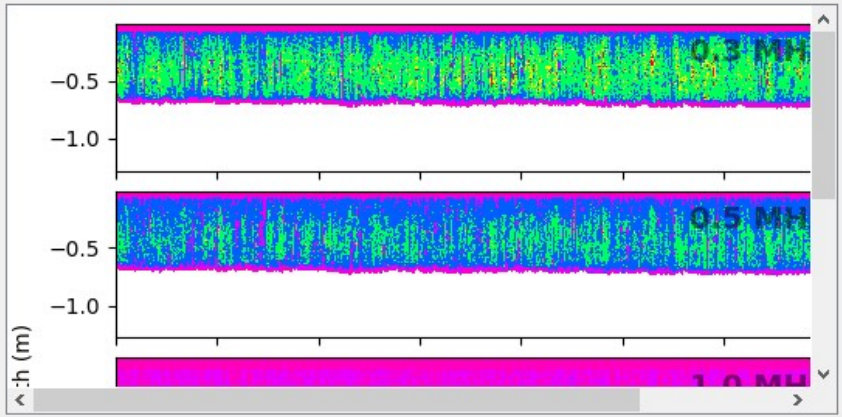
0.3 MHz

0.000 350.000

0.006 Volts

3

Plot SNR



Pre-processing options

SNR filter

SNR < 0

4

Despiking the signal

<V²>/<V>² <= 10 % x 4/pi Despiking the signal

Horizontal averaging

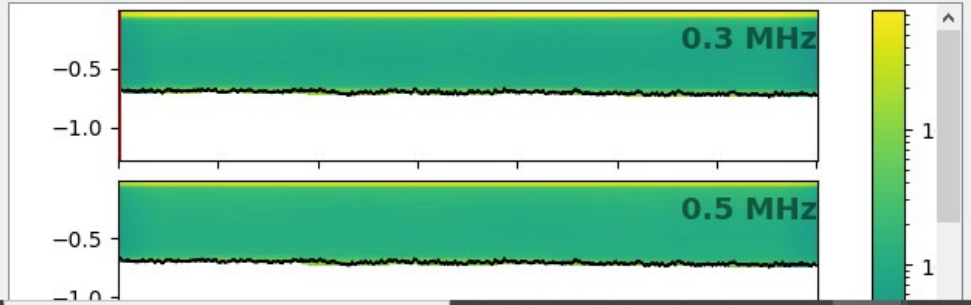
5

Horizontal +/- 160.0 cells = +/- 10.0 sec

6

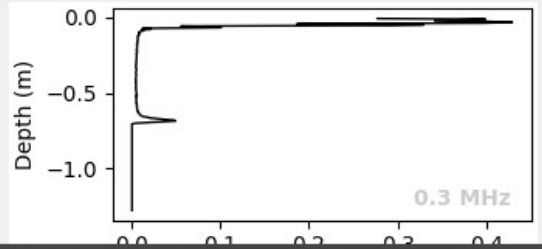
Display pre-processed data 2D fields

4



Display pre-processed data profile

0.3 MHz



List pre-processed data: user label

Type here to search

Les comptes 2024 de...

FRA 13:01 20/03/2025

- Step 1
  Click on blue refresh button
- Step 2
  Select *Profile tail* method
- Step 3
  Set the noise value to 0,006 Volts and click on green arrow button
- Step 4
  Set the SNR to 0 and press green arrow button (optional - for this case, inversion works well without filtering with SNR)
- Step 5
  Set the number of profile to ±160 cells and press enter. This number is converted to time in seconds.
- Step 6
  Click on red arrow button to compute average and to update plots.

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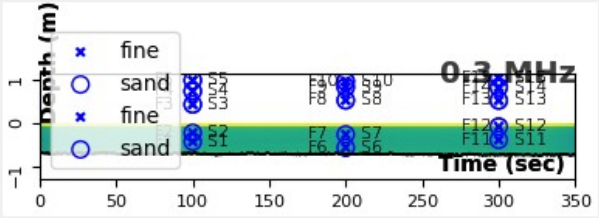
Plot samples positions

1 Plot Acoustic data | 20240703111300.aqa | 0.3 MHz



Display options

Total concentration plot

x axis: Concentration (g/L)

y axis: z (m)

Particle Size Distribution plot

Class PSD

Fine sediments

2 fine_sample.ods

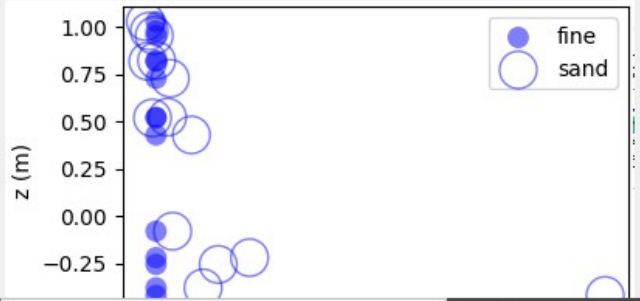
Color	Sample	time	depth
b	F1	100	-0.42
b	F2	100	-0.22
b	F3	100	0.43
b	F4	100	0.73
b	F5	100	0.98
b	F6	200	-0.556
b	F7	200	-0.256
b	F8	200	0.524

Sand sediments

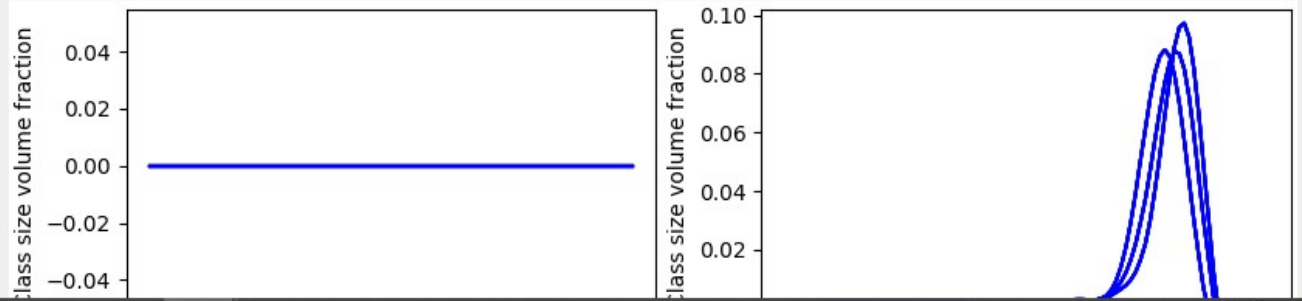
3 sand_sample.ods

Color	Sample	time	depth
b	S1	100	-0.42
b	S2	100	-0.22
b	S3	100	0.43
b	S4	100	0.73
b	S5	100	0.98
b	S6	200	-0.556
b	S7	200	-0.256
b	S8	200	0.524

Plot total concentration



Plot particle size distribution



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CAC40 index -1,01%

FRA 13:02 20/03/2025

- Step 1
  Click on *Plot Acoustic data* button

- Step 2
  Click on folder button and select file *fine_sample.ods*

- Step 3
  Click on folder button and select file sand_*sample.ods*

AcouSed - unsaved file

File Tools Help

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Step 1 : acoustic and sample data choice

1

Acoustic data 20240703111

2

Frequency 1 0.3 MHz

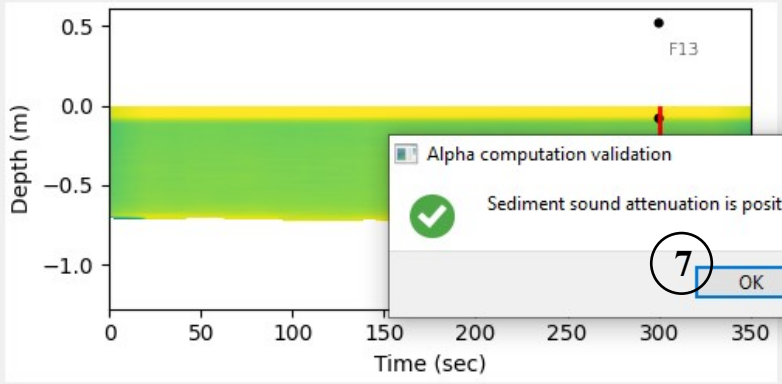
Frequency 2 1.0 MHz

3

Fine profile F11, F12, F...

Sand target S11

4 Plot sample



Alpha computation validation

Sediment sound attenuation is positive.

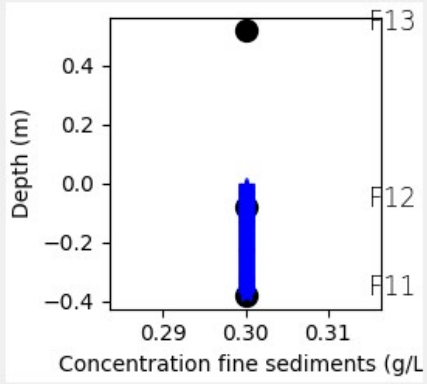
7 OK

Step 2 : profile of the fine sediment concentration

5 Interpolate

Sample	Depth (m)	time	Cfine (g/L)
F11	-0.42	100	0.3
F12	-0.22	100	0.3
F13	0.43	100	0.3

Sample	Depth (m)	time	Csand (g/L)
S11	-0.38	300	0.7976



Step 3 : Compute Calibration

☐ Import sediment calibration file

Import calibration

☑ Compute sediment calibration 6

Compute Calibration

T = 10.0 °C

	0.3 MHz		1.0 MHz	
kt	0.2802	V.m$^{1.5}$	0.2288	V.m$^{1.5}$
ks	0.05555	m.kg$^{-0.5}$	0.46489	m.kg$^{-0.5}$
sv	0.00015	m^{-1}	0.01029	m^{-1}
X	3.53			
αs	2.01999	m^{-1}	1.17210	m^{-1}
ζ	0.00	m^{-1}	0.00	m^{-1}

8

☐ Step 3 (for information) : Fluid Corrected Backscatter

When fine sediments concentration is constant and effect on sound attenuation on sand is negligible, this sediment attenuation alphas can be compared to the obtained by the sediment calibration computation.

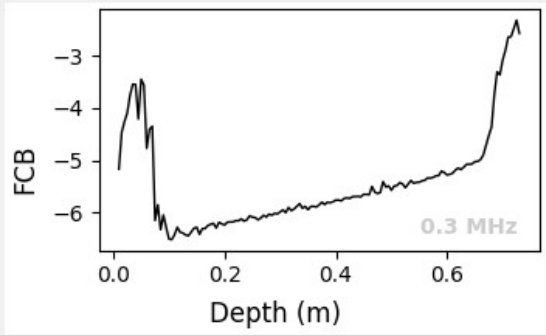
$\alpha_{s\,FCB} > 0$: comparison with calibration

$\alpha_{s\,FCB} < 0$: do not compare with calibration

Frequency 0.3 MHz

From m to m

Compute and Plot Linear regression α_s = 0.0dB/m



- Step 1
  Click on blue refresh button
- Step 2
  Select 0,3MHz for the *Frequency 1* and 1MHz for the *Frequency 2*
- Step 3
  Select *F11*, *F12* and *F13* for *Fine profile*
  Select *F11* for *Sand target*
- Step 4
  Click on *Plot sample* button to plot the samples concentrations profile
- Step 5
  Click on *Interpolate* button to interpolate the profile
- Step 6
  Select *Compute sediment calibration* and click on *Compute Calibration*
- Step 7
  Click on *OK* to close the validation window
- Step 8
  Click on *Save Calibration* and select the folder. The calibration data is record in a file with tha default name *Sediment_calibration_20240703111300.csv* (Sediment_calibration_*acoustic file name*.csv)

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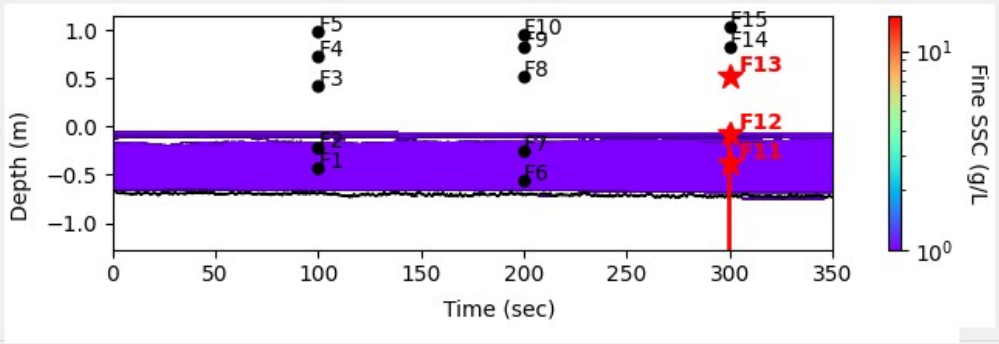
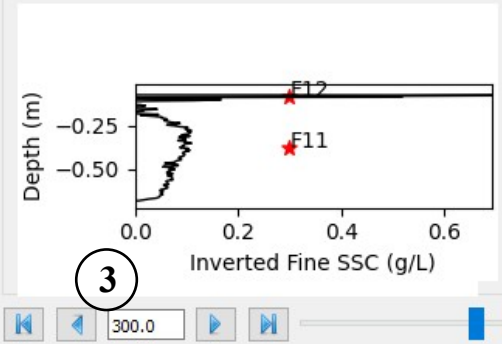
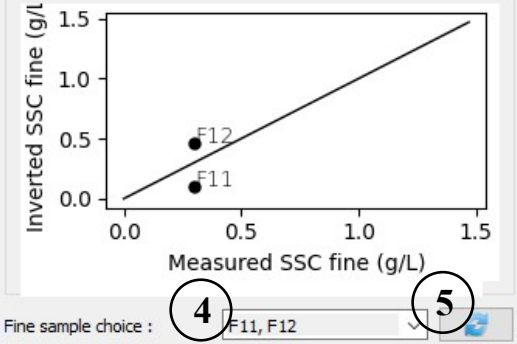
1 2024070311: RUN INVERSION 2

9 Save Results

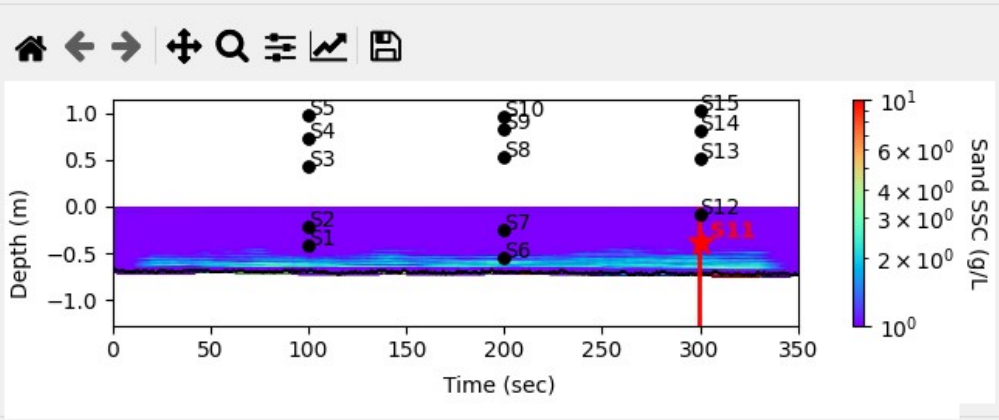


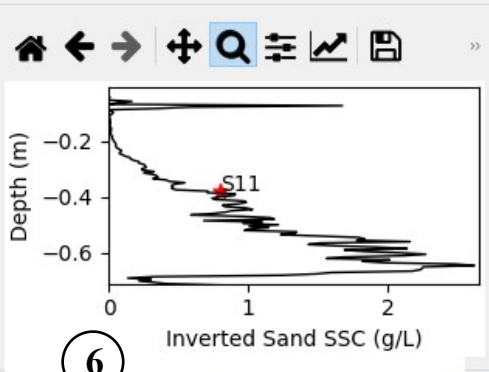


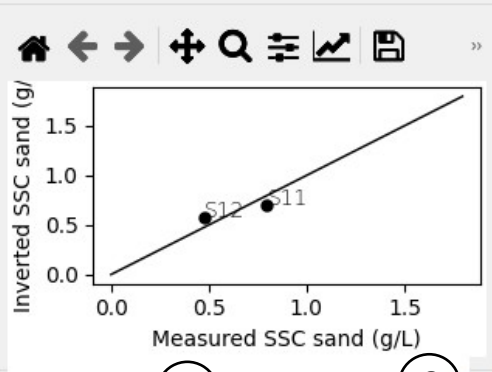


3 300.0

Fine sample choice : 4 F11, F12 5







6 299.875

Sand sample choice : 7 S11, S12 8

Type here to search SBF 120 -1,06% FRA 13:06 20/03/2025

- Step 1
  Click on blue refresh buton

- Step 2
  Click on *RUN INVERSION* button

- Step 3
  Set profile to 300 and press Enter to plot the fine concentration profile at the sample position (you can use the figure toolbar to adjust plot limits)

- Step 4
  Select *F11* and *F12*

- Step 5
  Click on blue refresh button to refresh the plot Measured SSC fine vs Inverted SSC fine

- Step 6
  Set profile to 300 and press Enter to plot the sand concentration profile at the sample position (you can use the figure toolbar to adjust plot limits)

- Step 7
  Select *F11* and *F12*

- Step 8
  Click on blue refresh button to refresh the plot Measured SSC sand vs Inverted SSC sand

- Step 9
  Click on *Save results* button. Choose the directory and set filename of the xlsx file.