

MapIT! guide

- Raw data pre-treatment (slides 1-4)
- Script and MapIT! interface guide (slides 5-25)

raw_data_map - Microsoft Excel

File Home Inserisci Layout di pagina Formule Dati Revisione Visualizza Sviluppo Foxtit PDF

Calibri 11 A⁺ A⁻ G C S Unisci e allinea al centro Numero % 000 0,00 0,00

Formattazione condizionale Formatta come tabella Stili cella Inserisci Elimina Formato

Somma automatica Riempimento Cancella Ordina e filtra Trova e seleziona

Pronto

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	data																	
2	1818	1346.7	353.5	336.7	11871.3	808	84.2	0	0	656.5								
3	1515	1290.6	216.4	72.1	10355.4	656.5	252.5	50.5	0	112.2								
4	1212	2272.5	63.1	252.5	12477.6	808	144.3	63.1	0	189.4								
5	1346.7	1627.2	126.3	202	11265	757.5	63.1	0	0	72.1								
6	1262.5	1616	336.7	252.5	9900.6	568.1	0	63.1	0	303								
7	1683.3	1739.4	353.5	392.8	10709	561.1	168.3	63.1	0	561.1								
8	1363.5	1571.1	202	202	10405.8	959.5	252.5	101	0	101								
9	1616	1795.6	202	360.7	10608.1	729.4	50.5	168.3	0	448.9								
10	1212	1616	568.1	216.4	11568	1010	151.5	0	0	441.9								
11	1666.5	1627.2	315.6	168.3	11394	505	63.1	84.2	0	336.7								
12	1414	1464.5	168.3	280.6	12780.9	1060.5	303	0	0	432.9								
13	2020	1739.4	168.3	378.8	10052.2	441.9	63.1	101	0	101								
14	1616	1795.6	224.4	303	11871.1	757.5	0	101	0	392.8								
15	1464.5	1178.3	168.3	216.4	9193.1	561.1	189.4	252.5	0	224.4								
16	1851.7	1616	336.7	280.6	10961.6	808	189.4	0	0	561.1								
17	2121	1739.4	189.4	144.3	11668.9	555.5	84.2	189.4	0	404								
18	1313	1161.5	168.3	72.1	11163.8	1060.5	126.3	84.2	0	606								
19	1627.2	1717.1	168.3	84.2	9541.3	1010	112.2	50.5	0	202								
20	1327729.5	88781.4	17347.1	1515	25569.5	1122.2	10305.2	11787.1	3181.8	146280.8								
21	1993127.8	24651.2	9346.2	606	26226.3	79495.7	6736.2	16327.9	2188.6	183848.4								
22	1093459.2	10254.6	11523.7	606	21979.5	631.3	2878.7	1666.5	2373.7	152468.8								
23	932040	12686.2	4091	441.9	21979.4	897.8	7689.2	25417.1	3591.6	176056.6								
24	1306844.9	21374.4	3142.4	448.9	23546.4	505	2979.6	6285.4	2474.6	139880.2								
25	1028364.4	16448.8	2188.4	656.5	22586.1	897.8	7224.2	2171.5	1666.5	88093								

Rawdata Foglio2 Foglio3

The whole dataset must be copied in a single Excel spreadsheet.

The first row must be a non-numerical string. Type a random word ('data' in this case), or copy the name of your elements.

The data sheet must be renamed as '**Rawdata**'.

raw_data_map - Microsoft Excel

File Home Inserisci Layout di pagina Formule Dati Revisione Visualizza Sviluppo Foxit PDF

Calibri 11 A A

Incolla Appunti

Carattere

Allineamento

Numero

Formattazione condizionale

Formatta come tabella

Stili cella

Inserisci Elimina Formato

Celle

Somma automatica

Riempimento

Cancella

Modifica

Ordina e filtra

Trova e seleziona

A1 data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
247	1506102.7	9725.1	6455.2	404	24985.8	841.7	5000.3	808	4041.1	157893.4								
248	1683470.8	4601.7	3647.8	505	23243.2	785.6	2356.7	505	4265.3	123725.8								
249	1484589.1	4242.6	2356.8	404	21372.8	353.5	2861.9	785.6	1795.7	98415.5								
250	1020966.2	3131.1	1161.5	101	22282.5	1212	5106.9	448.9	2525.2	160033.6								
251	875660.8	3888.7	2188.6	448.9	23192.8	505	5050.7	3535.2	2525.1	212530.8								
252	1086689	15212.1	4748.1	707	18390.3	441.9	1795.6	1795.6	1010	131035.1								
253	129910.8	2272.6	336.7	336.7	11972.2	673.3	84.2	360.7	72.1	6515.6								
254	12379.6	1515	0	315.6	12022.7	404	84.2	168.3	0	1666.6								
255	38775.3	1739.4	224.4	378.8	11921.8	378.8	84.2	0	0	656.5								
256	3030.3	1571.1	378.8	441.9	11113.2	454.5	126.3	151.5	0	555.5								
257																		
258																		
259	1010	1571.1	126.3	252.5	10860.6	404	63.1	0	0	441.9								
260	1666.5	1363.5	112.2	280.6	12780.6	673.3	0	0	0	216.4								
261	1363.5	1818	0	144.3	9395.4	883.8	202	63.1	0	303								
262	1515	1313	168.3	360.7	11163.8	656.5	303	0	0	126.3								
263	1346.7	1795.6	505	252.5	11365.9	757.5	0	0	0	505								
264	1795.7	1571.1	0	126.3	11719.5	252.5	0	0	0	448.9								
265	1515	1010	252.5	224.4	11467.1	606	126.3	168.3	0	303								
266	1464.5	1868.5	144.3	189.4	11315.5	785.6	168.3	0	0	336.7								
267	1578.1	959.5	168.3	72.1	11163.9	505	0	84.2	0	448.9								
268	1868.5	2222	126.3	353.5	10911.2	336.7	84.2	50.5	0	280.6								
269	1363.5	1262.5	84.2	252.5	10911.3	505	84.2	151.5	0	280.6								
270	1515	1346.7	216.4	151.5	12528	454.5	280.6	202	0	315.6								
271	1683.3	909	63.1	336.7	11719.5	617.2	0	101	0	336.7								

2 empty rows

Laser ablation line 1

Laser ablation line 2

Pronto

100%

Each data line must be separated from the next one by two empty rows.

STD_DATA - Microsoft Excel

File Home Inserisci Layout di pagina Formule Dati Revisione Visualizza Sviluppo Foxtit PDF

Calibri 11 A A

Incolla

Appunti

Carattere

Allineamento

Generale

Formattazione condizionale

Formatta come tabella

Stili cella

Inserisci Elimina Formato

Celle

Somma automatica

Riempimento

Cancella

Modifica

Ordina e filtra

Trova e seleziona

A1 43Ca

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	43Ca	63Cu	66Zn	67Zn	86Sr	133Cs	137Ba	208Pb	238U	25Mg						
2																
3	1212	1515	56.1	168.3	11669.1	841.7	0	0	0	378.8						
4	1010	2070.5	63.1	112.2	11265	729.4	101	252.5	0	353.5						
5	1402.8	1515	63.1	151.5	11214.3	858.5	252.5	50.5	0	280.6						
6	1290.6	2070.5	0	252.5	13134.5	707	50.5	84.2	0	505						
7	1717	1414	126.3	224.4	10658.3	1199.4	0	0	0	454.5						
8	1313	959.5	56.1	303	11365.8	808	0	101	0	216.4						
9	909	2525.1	224.4	216.4	11264.9	897.8	50.5	0	0	216.4						
10	1666.5	1363.5	144.3	252.5	12426.9	959.5	126.3	0	0	454.5						
11	1414	1565.5	112.2	454.5	10911.2	336.7	50.5	168.3	0	56.1						
12	1414	1178.3	84.2	404	11113.3	953.9	168.3	168.3	0	841.7						
13	1111	2412.8	126.3	448.9	10810.2	1388.8	0	202	0	50.5						
14	1739.4	1919	126.3	126.3	11770.2	909	84.2	101	0	126.3						
15	1818	1212	353.5	392.8	12966.2	555.5	50.5	126.3	0	568.1						
16	1616	2070.5	168.3	505	12578.7	505	0	112.2	0	126.3						
17	1868.5	1767.6	189.4	392.8	12123.8	1313	63.1	0	0	392.8						
18	1739.4	2300.6	0	202	10810	1212	101	336.7	0	216.4						
19	1767.5	1414	288.6	288.6	11820.6	729.4	0	0	0	189.4						
20	1402.8	1616	0	649.3	11163.7	1717	168.3	168.3	0	202						
21	24538	19483.9	2356.8	1627.3	1108198.7	1346.7	24256.1	369686.4	12831.6	897.9						
22	2064726.8	222283.8	20492.4	7015.9	5289782.9	1212	66516	402376.4	30453.7	187800						
23	1489414.4	263042.2	41454.4	8195.2	4941257.6	454.5	68352.8	424981.6	14601.5	334264.4						
24	1606365.8	258593.3	29569.9	3030.1	3148619.9	1313	62261.9	288501.2	17834.7	292767.6						
25	2670422.6	240062	33054.9	9374.1	6978548.7	808	81687.3	435348.4	17381.3	231084.2						

Pronto

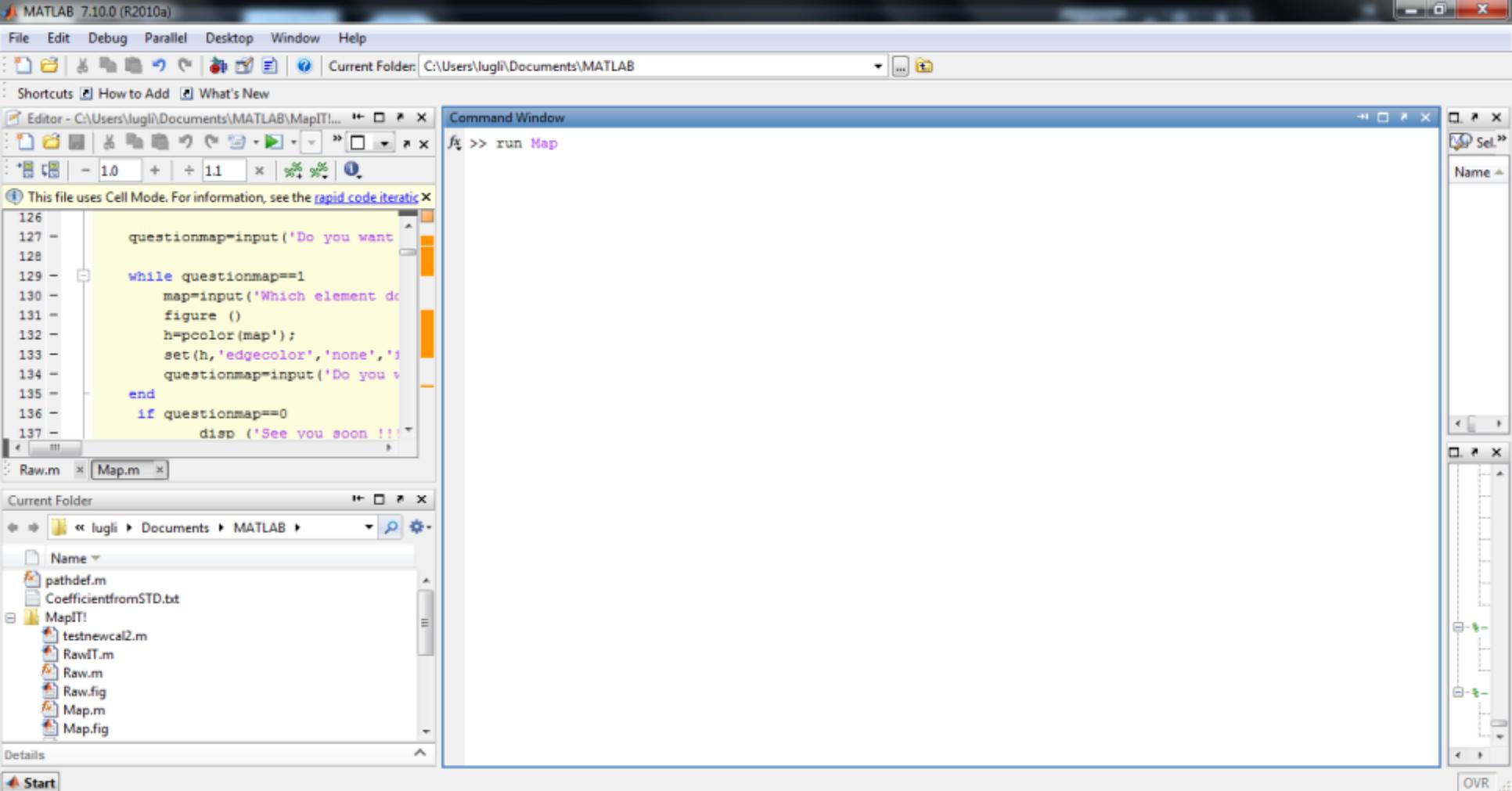
The first row must contain element names.
 The second row must be empty.
 From the third row, you can paste your data.
 The data sheet must be renamed as 'STDMAP'.

STD_CONC [modalità compatibilità] - Microsoft Excel

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1		Ca	Cu	Zn	Zn67	Sr	Cs	Ba	Pb	U	Mg					
2	MACS-3	376900	120	111	111	6760	0.015	58.7	56.5	1.52	1756					
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																

Pronto

The first row must contain element names. Leave cell A1 empty.
 The second row must contain the element concentrations in ppm.
 Within cell A2, insert the name of the standard reference material.
 The data sheet must be renamed as 'NISTCONCENTRATION'.



To run the MapIT script, the two files (Mapit.m and Mapit.fig) must be in one of your MATLAB paths.

Type **'run Mapit'** in the workspace and enter (keyboard) to open the MapIT interface.

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

Step2 - Ref. Material data and conc.

Step3
Insert:
Number of elements:
Number of lines:

Step4 - Sample Background Subtraction
Insert:
First bckg cycle:
Last bckg cycle:
First analysis cycle:
Last analysis cycle:

Step5 - Ref. Material Background Subtraction
Insert:
First bckg cycle:
Last bckg cycle:
First analysis cycle:
Last analysis cycle:

Step6 - RISCAL
Enter the column # of your int. std. in the calibration material:

Step7 - RISSAM
Click to choose the INT.STD of your SAMPLE

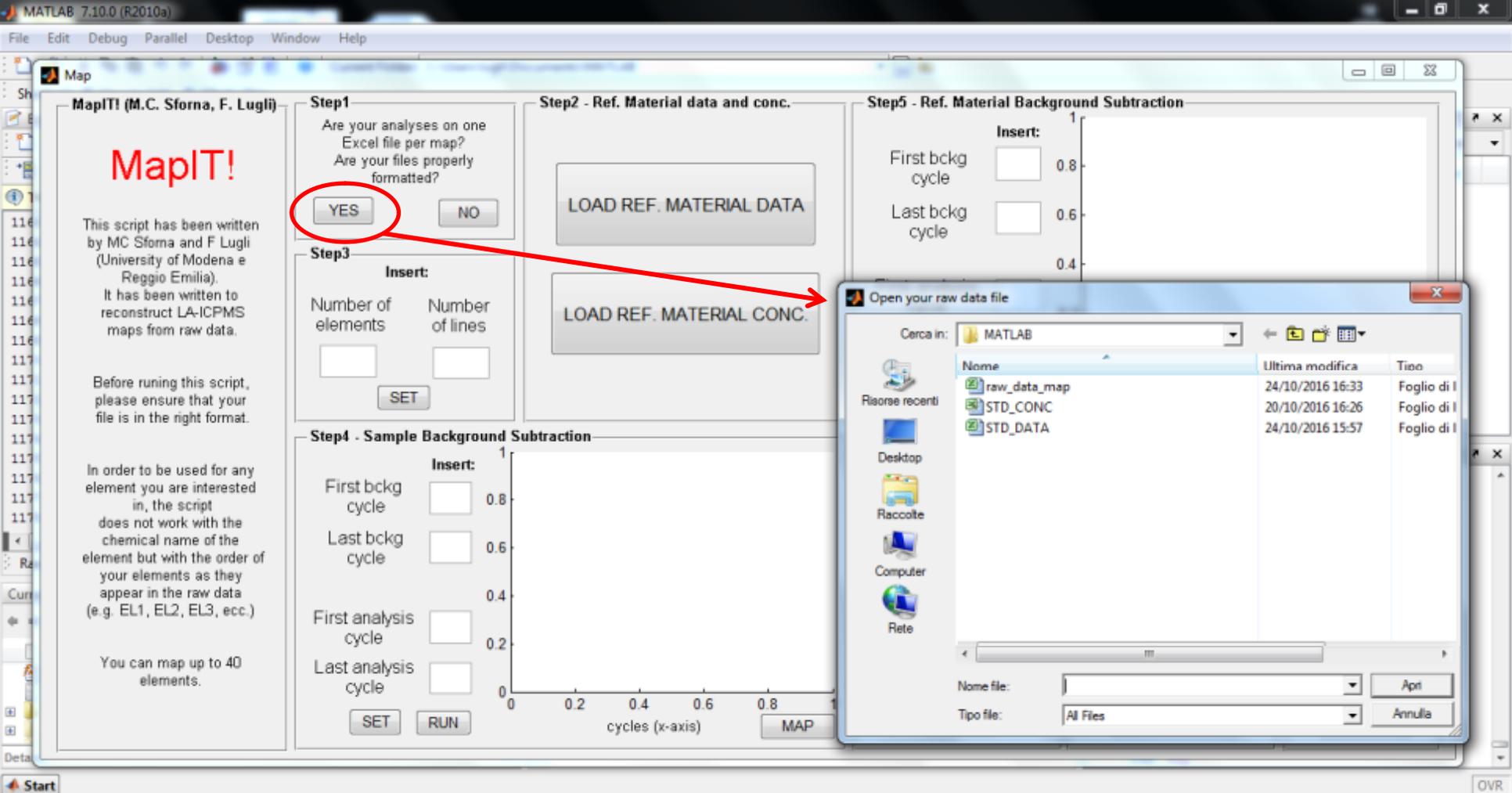
Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:

Step9 - PPM CONVERSION
External ref. material + internal std

Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!

MapIT! brings you to a step by step map building.
Simply follow the step order to avoid possible issues during map building.



By clicking 'YES', you will start the script run.
A window will open asking to load the raw data file for the map.
By clicking 'NO', you will end the script.

Presentazione standard1 - Microsoft PowerPoint

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Map

MapIT! (M.C. Sforna, F. Lugli)

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Before running this script, please ensure that your file is in the right format.

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You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

Step2 - Ref. Material data and conc.

Step3
Insert:
Number of elements
Number of lines

Step4 - Sample Background Subtraction
Insert:
First bckg cycle
Last bckg cycle
First analysis cycle
Last analysis cycle

Step5 - Ref. Material Background Subtraction
Insert:
First bckg cycle
Last bckg cycle

LOAD REFERENCE MATERIAL RAW DATA (xls or xlsx)

Cerca in: MATLAB

Nome	Ultima modifica	Tipo
raw_data_map	24/10/2016 16:33	Foglio di I
STD_CONC	20/10/2016 16:26	Foglio di I
STD_DATA	24/10/2016 15:57	Foglio di I

Nome file:
Tipo file:

CLICK Calibration Calibration

Diapositiva 2 di 4 Tema di Office Italiano (Italia) 69%

By clicking 'LOAD.REF. MATERIAL DATA', a window will appear asking to load the raw data of your reference material.

Presentazione standard1 - Microsoft PowerPoint

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Map

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

Step2 - Ref. Material data and conc.

Step3
Insert:
Number of elements
Number of lines

Step4 - Sample Background Subtraction
Insert:
First bckg cycle
Last bckg cycle
First analysis cycle
Last analysis cycle

Step5 - Ref. Material Background Subtraction
Insert:
First bckg cycle
Last bckg cycle

LOAD REFERENCE MATERIAL CONCENTRATION FILE (xls orxlsx)

Cerca in: 21_10_2016

Nome	Ultima modifica	Tipo
raw_data_map	24/10/2016 16:33	Foglio di l
STD_CONC	20/10/2016 16:26	Foglio di l
STD_DATA	24/10/2016 15:57	Foglio di l

Nome file:
Tipo file:

CLICK Calibration Calibration

Diapositiva 2 di 4 Tema di Office Italiano (Italia) 69%

By clicking 'LOAD.REF. MATERIAL CONC.', a window will appear asking to load the file with the elemental concentrations of the reference material.

MapIT! (M.C. Sforna, F. Lugli)

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?
YES NO

Step2 - Ref. Material data and conc.
LOAD REF. MATERIAL DATA
LOAD REF. MATERIAL CONC.

Step3
Insert:
Number of elements: 10
Number of lines: 10
SET

Step4 - Sample Background Subtraction
First bckg cycle: []
Last bckg cycle: []
First analysis cycle: []
Last analysis cycle: []
SET RUN

Step5 - Ref. Material Background Subtraction
Insert:
First bckg cycle: []
Last bckg cycle: []
First analysis cycle: []
Last analysis cycle: []
SET RUN MAP

Step6 - RISSCAL
Enter the column # of your int. std. in the calibration material:
[] SET

Step7 - RISSAM
Click to choose the INT.STD of your SAMPLE
CLICK

Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:
[] SET

Step9 - PPM CONVERSION
External ref. material + internal std
Calibration

Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).
Calibration

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!
MAP IT!

run Map

Enter the number of analyzed elements and the number of lines of your map. In this example, we analyzed 10 elements (^{43}Ca , ^{63}Cu , ^{66}Zn , ^{67}Zn , ^{86}Sr , ^{133}Cs , ^{137}Ba , ^{208}Pb , ^{238}U , ^{25}Mg) making a 10 line map.

MapIT! (M.C. Sforna, F. Lugli)

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In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?
YES NO

Step2 - Ref. Material data and conc.
LOAD REF. MATERIAL DATA
LOAD REF. MATERIAL CONC.

Step3
Insert:
Number of elements: 10
Number of lines: 10
SET

Step4 - Sample Background Subtraction
Insert:
First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 100
Last analysis cycle: 600
cycles (x-axis): 100 200 300 400 500 600
MAP

Step5 - Ref. Material Background Subtraction
First bckg cycle: []
Last bckg cycle: []
First analysis cycle: []
Last analysis cycle: []
cycles (x-axis): 0 0.2 0.4 0.6 0.8 1
SET RUN MAP

Step6 - RISSCAL
Enter the column # of your int. std. in the calibration material:
[] SET

Step7 - RISSAM
Click to choose the INT.STD of your SAMPLE
CLICK

Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:
[] SET

Step9 - PPM CONVERSION
External ref. material + internal std
Calibration

Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).
Calibration

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!
MAP IT!

run Map

By clicking 'MAP', a raw map of the first element of your analysis set appears, helping you to choose the parameters for background subtraction. Then, you can fill the empty fields on the left with the proper cycle number (x-axis) to select the background area and the analysis area. **Do not forget to click 'SET' and 'RUN'.**

Presentazione standard1 - Microsoft PowerPoint

Map

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

Step2 - Ref. Material data and conc.

Step3
Insert:
Number of elements:
Number of lines:

Step4 - Sample Background Subtraction
Insert:
First bckg cycle:
Last bckg cycle:
First analysis cycle:
Last analysis cycle:

cycles (x-axis)

Step5 - Ref. Material Background Subtraction - STD
Insert:
First bckg cycle:
Last bckg cycle:
First analysis cycle:
Last analysis cycle:

cycles (x-axis)

Step6 - RISCAL
Enter the column # of your int. std. in the calibration material:

Step7 - RISSAM
Click to choose the INT.STD of your SAMPLE

Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:

Step9 - PPM CONVERSION
External ref. material + internal std

Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!

By clicking 'MAP', a raw map of the first element of your ref. material analysis appears, helping you to choose the parameters for background subtraction. Then, you can fill the empty fields on the left with the proper cycle number (x-axis) to select the background area and the analysis area. **Do not forget to click 'SET' and 'RUN'.**

Presentazione standard1 - Microsoft PowerPoint

Map

MapIT! (M.C. Sforza, F. Lugli)

MapIT!

This script has been written by MC Sforza and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

YES NO

Step2 - Ref. Material data and conc.

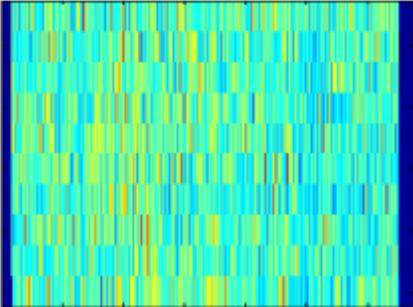
LOAD REF. MATERIAL DATA

LOAD REF. MATERIAL CONC.

Step3
Insert:
Number of elements: 10
Number of lines: 10
SET

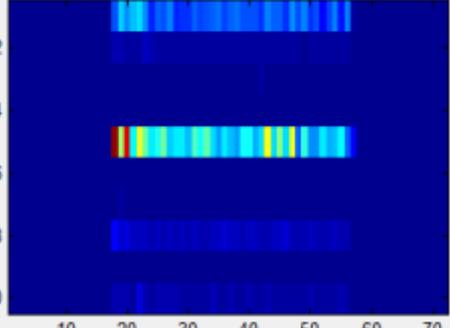
Step4 - Sample Background Subtraction

Insert:
First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 100
Last analysis cycle: 600
SET RUN



Step5 - Ref. Material Background Subtraction STD

Insert:
First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 20
Last analysis cycle: 55
SET RUN



Step6 - RISCAL
Enter the column # of your int. std. in the calibration material:
1 SET

Step7 - RISSAM
Click to choose the INT STD of your SAMPLE
CLICK

Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:
SET

Step9 - PPM CONVERSION
External ref. material + internal std
Calibration

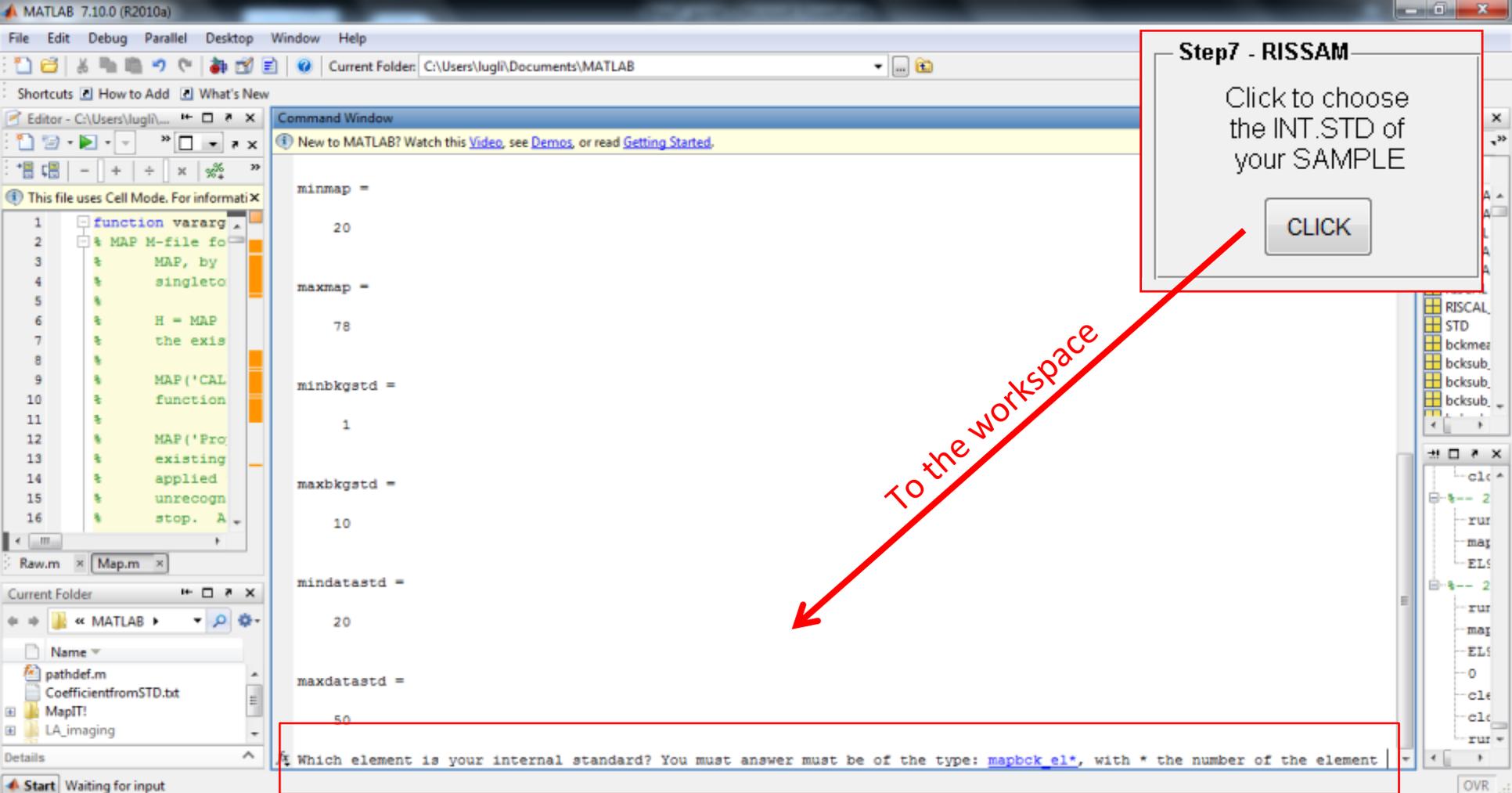
Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).
Calibration

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!
MAP IT!

Fare clic per inserire le note

Diapositiva 7 di 9 Tema di Office Italiano (Italia) 69%

Enter the column number of the internal standard in the reference material. In this example, we choose Ca as internal standard which is the first element analyzed, appearing in the first column of our raw data. Therefore we enter '1'.



The 'CLICK' button brings you back to the MATLAB workspace. Here, you have to enter the internal standard of your sample, typing '`mapbck_el*`', with * the number of the element as it appears in the raw data, and enter (keyboard). In this example, we choose Ca which is the first element analyzed, appearing in the first column of our raw data. Therefore we typed '`mapbck_el1`'.

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

YES NO

Step2 - Ref. Material data and conc.

LOAD REF. MATERIAL DATA

LOAD REF. MATERIAL CONC.

Step3

Insert:

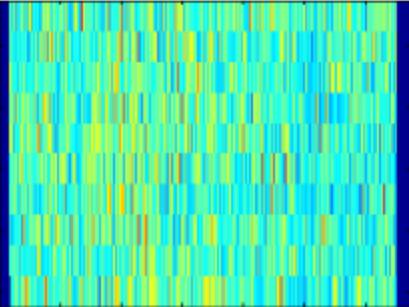
Number of elements: 10
Number of lines: 10

SET

Step4 - Sample Background Subtraction

Insert:

First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 100
Last analysis cycle: 600



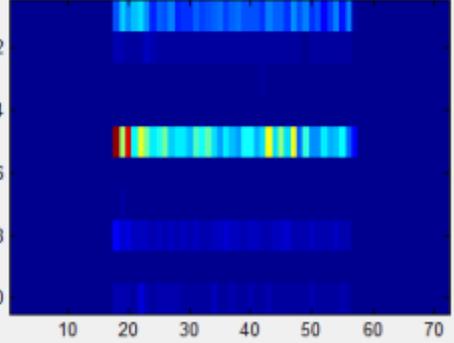
cycles (x-axis)

SET RUN MAP

Step5 - Ref. Material Background Subtraction STD

Insert:

First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 20
Last analysis cycle: 55



cycles (x-axis)

SET RUN MAP

Step6 - RISCAL

Enter the column # of your int. std. in the calibration material:

1 SET

Step7 - RISSAM

Click to choose the INT.STD of your SAMPLE

CLICK

Step8 - CISSAM

Enter the conc. (ppm) of the intd. std. in the sample:

380000 SET

Step9 - PPM CONVERSION

External ref. material + internal std

Calibration

Step9 (2) - Optional

Calibration with the ONLY reference material (external calibration).

Calibration

Step10 - Map IT!

To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!

MAP IT!

mapbck_el1

Enter the concentration (ppm) of your internal standard in the sample. Do not forget to click 'SET'. In this example, the Ca concentration of our sample is 380000 ppm.

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

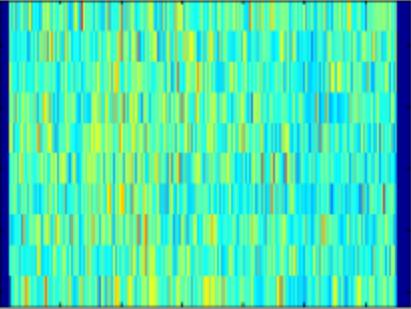
In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

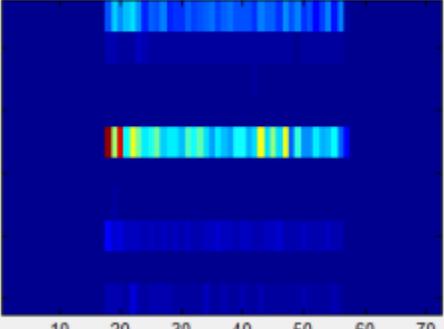
You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

Step2 - Ref. Material data and conc.

Step3
Insert:
Number of elements: Number of lines:

Step4 - Sample Background Subtraction
Insert:
First bckg cycle: Last bckg cycle:
First analysis cycle: Last analysis cycle:
 

Step5 - Ref. Material Background Subtraction - STD
Insert:
First bckg cycle: Last bckg cycle:
First analysis cycle: Last analysis cycle:
 

Step6 - RISCAL
Enter the column # of your int. std. in the calibration material:

Step7 - RISSAM
Click to choose the INT.STD of your SAMPLE

Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:

Step9 - PPM CONVERSION
External ref. material + internal std

Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!

mapbck_el1

By clicking 'Calibration', your raw data will be converted in ppm using both the internal standard and the reference material (see Longerich et al., 1996). **If you would like to calibrate ONLY with the reference material, skip this step and go to STEP9 (2).**

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

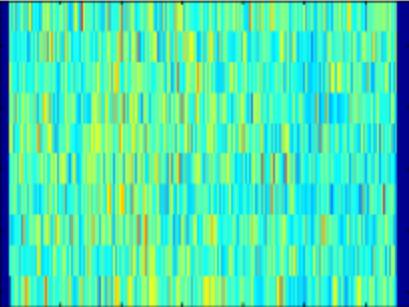
In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

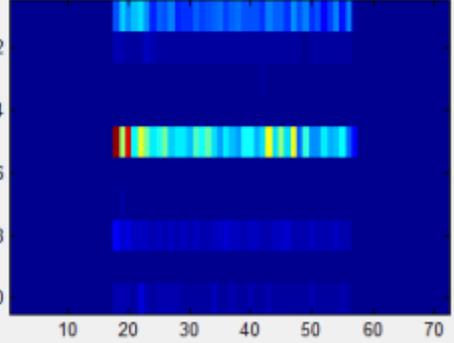
You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

Step2 - Ref. Material data and conc.

Step3
Insert:
Number of elements:
Number of lines:

Step4 - Sample Background Subtraction
Insert:
First bckg cycle:
Last bckg cycle:
First analysis cycle:
Last analysis cycle:
 

Step5 - Ref. Material Background Subtraction STD
Insert:
First bckg cycle:
Last bckg cycle:
First analysis cycle:
Last analysis cycle:
 

Step6 - RISCAL
Enter the column # of your int. std. in the calibration material:

Step8 - CISSAM
Enter the conc. (ppm) of the intd. std. in the sample:

Step9 - PPM CONVERSION
External ref. material + internal std

Step9 (2) - Optional
Calibration with the ONLY reference material (external calibration).

Step10 - Map IT!
To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!

Details: mapbck_el1

To calibrate ONLY with the external reference material, skip STEP6, 7, 8 and 9 and click the 'Calibration' button of STEP9 (2).

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

YES NO

Step2 - Ref. Material data and conc.

LOAD REF. MATERIAL DATA

LOAD REF. MATERIAL CONC.

Step3

Insert:

Number of elements: 10
Number of lines: 10

SET

Step4 - Sample Background Subtraction

Insert:

First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 100
Last analysis cycle: 600

SET RUN

cycles (x-axis): 100 200 300 400 500 600

MAP

Step5 - Ref. Material Background Subtraction STD

Insert:

First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 20
Last analysis cycle: 55

SET RUN

cycles (x-axis): 10 20 30 40 50 60 70

MAP

Step6 - RISCAL

Enter the column # of your int. std. in the calibration material:

1 SET

Step7 - RISSAM

Click to choose the INT.STD of your SAMPLE

CLICK

Step8 - CISSAM

Enter the conc. (ppm) of the intd. std. in the sample:

380000 SET

Step9 - PPM CONVERSION

External ref. material + internal std

Calibration

Step9 (2) - Optional

Calibration with the ONLY reference material (external calibration).

Calibration

Step10 - Map IT!

To map your element, you will be taken back to the Matlab workspace. Just follow the instructions there!

MAP IT!

mapbck_el1

Start

OVR

By clicking 'MAP IT!', you will be go back to the MATLAB workspace. You can choose the element to map by typing EL*, with * the number of the element as it appears in your analysis, and enter (keyboard). Otherwise, you can map an element ratio typing EL*/EL*.

After that, a text string will appear in the workspace, asking if you would like to map another element. Typing '1' (= yes) you can make another map, typing '0' (= no) you will end the script. You can repeat this process an unlimited number of times.

MapIT! (M.C. Sforna, F. Lugli)

MapIT!

This script has been written by MC Sforna and F Lugli (University of Modena e Reggio Emilia). It has been written to reconstruct LA-ICPMS maps from raw data.

Before running this script, please ensure that your file is in the right format.

In order to be used for any element you are interested in, the script does not work with the chemical name of the element but with the order of your elements as they appear in the raw data (e.g. EL1, EL2, EL3, ecc.)

You can map up to 40 elements.

Step1
Are your analyses on one Excel file per map?
Are your files properly formatted?

YES NO

Step2 - Ref. Material data and conc.

LOAD REF. MATERIAL DATA

LOAD REF. MATERIAL CONC.

Step3

Insert:

Number of elements: 10
Number of lines: 10

SET

Step4 - Sample Background Subtraction

Insert:

First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 100
Last analysis cycle: 600

SET RUN

cycles (x-axis): 100 200 300 400 500 600

MAP

Step5 - Ref. Material Background Subtraction STD

Insert:

First bckg cycle: 1
Last bckg cycle: 10
First analysis cycle: 20
Last analysis cycle: 55

SET RUN

cycles (x-axis): 10 20 30 40 50 60 70

MAP

Step6 - RISCAL

Enter the column # of your int. std. in the calibration material:

1 SET

Step7 - RISSAM

Click to choose the INT.STD of your SAMPLE

CLICK

Step8 - CISSAM

Enter the conc. (ppm) of the intd. std. in the sample:

380000 SET

Step9 - PPM CONVERSION

External ref. material + internal std

Calibration

Step9 (2) - Optional

Calibration with the ONLY reference material (external calibration).

Calibration

Step10 - Map IT!

To map your element, you will be taken back to the Matlab workspace. Just follow the instructions in there!

MAP IT!

mapbck_el1

Start

OVR

You can change the range of the data considered for the map (STEP4) and/or other parameters (STEP5, 6, 7, 8).

Do not forget to APPLY the changes to your data by clicking the proper buttons. Then, recalibrate (STEP9).

MATLAB 7.10.0 (R2010a)

File Edit Debug Parallel Desktop Window Help

Current Folder: C:\Users\lujli\Documents\MATLAB

Shortcuts How to Add What's New

Editor - C:\Users\lujli\Documents\MATLAB\MapIT\Map.m

```
1 function varargout = Map(varargin)
2 % MAP M-file for
3 % MAP, by
4 % singleto
5 %
6 % H = MAP
7 % the exis
8 %
9 % MAP('CA
10 % function named CALLBACK in MAP.M with
11 %
12 % MAP('Property','Value',...) creates a
13 % existing singleton*. Starting from t
14 % applied to the GUI before Map_Opening
15 % unrecognized property name or invalid
16 % stop. All inputs are passed to Map_O
```

Command Window

```
78
minboard =
mindatastd =
20
maxdatastd =
50
Which element is your internal sta
CISSAM =
380000
Which element do you want to map? The answer should be w
Do you want to map another element? yes = 1 no = 0
```

Figures - Figure 1

By clicking this button, you will add the colorbar to your map (scale in ppm).

Raw.m Map.m

Current Folder: C:\Users\lujli\Documents\MATLAB

Details

Start Waiting for input

mapbox_el1
EL9

OVR

By clicking this button, you will be able to adjust the size and the position of the colorbar and change the colors of the map.

```
H = MAP returns the handle to a new M
the existing singleton*.

MAP('CALLBACK', hObject,eventData,hand
function named CALLBACK in MAP.M with

MAP('Property','Value',...) creates a
existing singleton*. Starting from t
applied to the GUI before Map_Opening
unrecognized property name or invalid
stop. All inputs are passed to Map_O
```

maxbkgstd = 10
mindatastd = 20
maxdatastd = 50
CISSAM = 380000

Which element is your
Which element do you
Do you want to map another element?

Colormap: Hot

- Jet
- HSV
- Hot
- Cool
- Spring
- Summer
- Autumn
- Winter
- Gray
- Bone
- Copper
- Pink
- Lines
- Custom

More info:

https://mathworks.com/help/matlab/creating_plots/plotting-tools--interactive-plotting.html

```

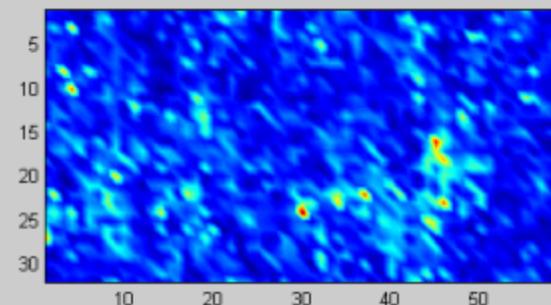
1 function varargout = Map(varargin)
2 % MAP M-file for Map.fig
3 % MAP, by itself, creates a new MAP or
4 % singleton*.
5 %
6 % H = MAP returns the handle to a new M
7 % the existing singleton*.
8 %
9 % MAP('CALLBACK',hObject,eventData,hand
10 % function named CALLBACK in MAP.M with
11 %
12 % MAP('Property','Value',...) creates a

```

```

minbkgstd =
           1
maxbkgstd =
          10
mindatastd =
          20

```



Right-click on the colorbar, then select 'Open Colormap Editor'.

- Delete
- Location
- Standard Colormaps
- Interactive Colormap Shift
- Open Colormap Editor
- Show Property Editor
- Show M-Code

Colormap Editor

File Edit Tools Help

Current color info

Index:	R:	H:
CData:	G:	S:
	B:	V:

Interpolating colorspace:

Color data min:

Color data max:

Immediate apply

OK Cancel Apply Help

Here you can adjust the color scale, the minimum and the maximum data to fix eventual outliers.

```

1 function varargout = Map(varargin)
2 % MAP M-file for Map.fig
3 % MAP, by itself, creates a new MAP or
4 % singleton*.
5 %
6 % H = MAP returns the handle to a new M
7 % the existing singleton*.
8 %
9 % MAP('CALLBACK', hObject,eventData,hand
10 % function named CALLBACK in MAP.M with
11 %
12 % MAP('Property','Value',...) creates a
13 % existing singleton*. Starting from t
14 % applied to the GUI before Map_Opening
15 % unrecognized property name or invalid
16 % stop.

```

```

minbkgstd =
    1
maxbkgstd =
   10
mindatastd =
   20
maxdatastd =

```

Raw.m x Map.m x

Current Folder

C:\Users\jugli\Documents

Name

pathdef.m

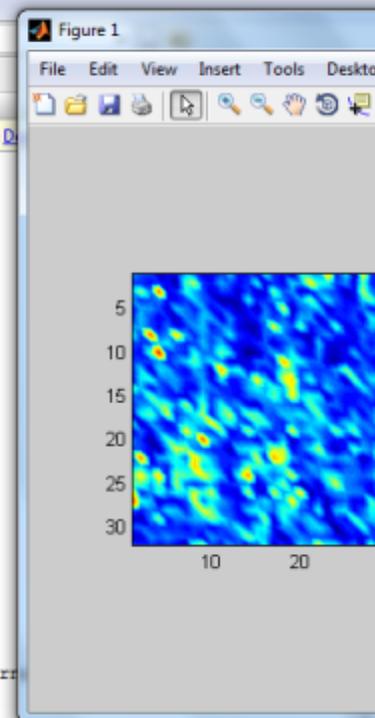
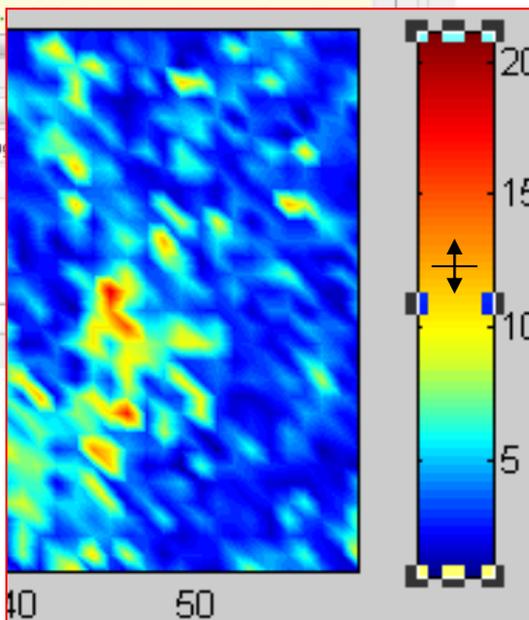
CoefficientfromSTD.txt

MapIT

LA_imaging

Details

Start Waiting for input



Right-click on the colorbar, then select 'Interactive Colormap Shift'.

element is your intere

80000

element do you want to map? The answer should be w

want to map another element? yes = 1 no = 0 1

element do you want to map? The answer should be w

want to map another element? yes = 1 no = 0

clear

clc

run Map

mapbck_e11

EL9

1

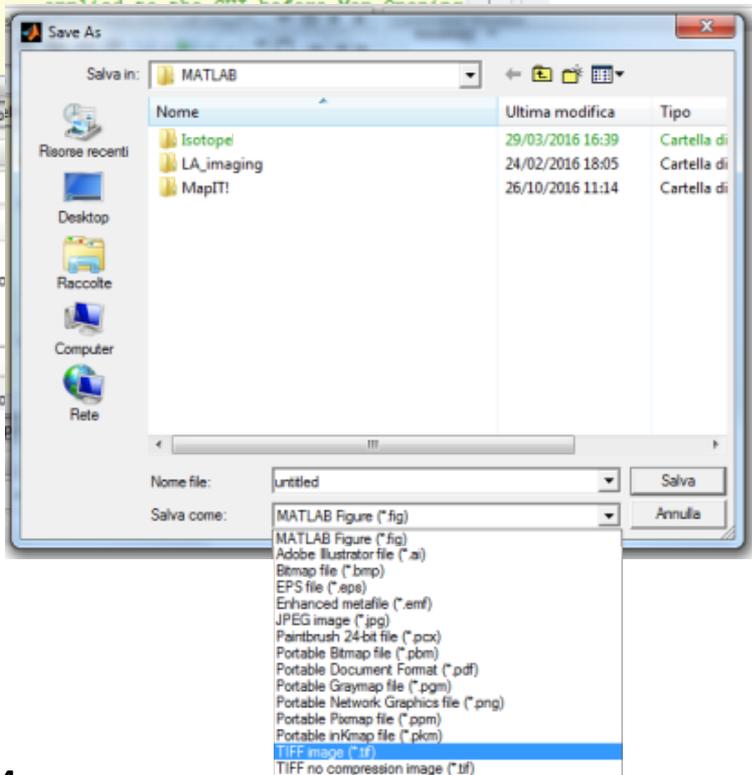
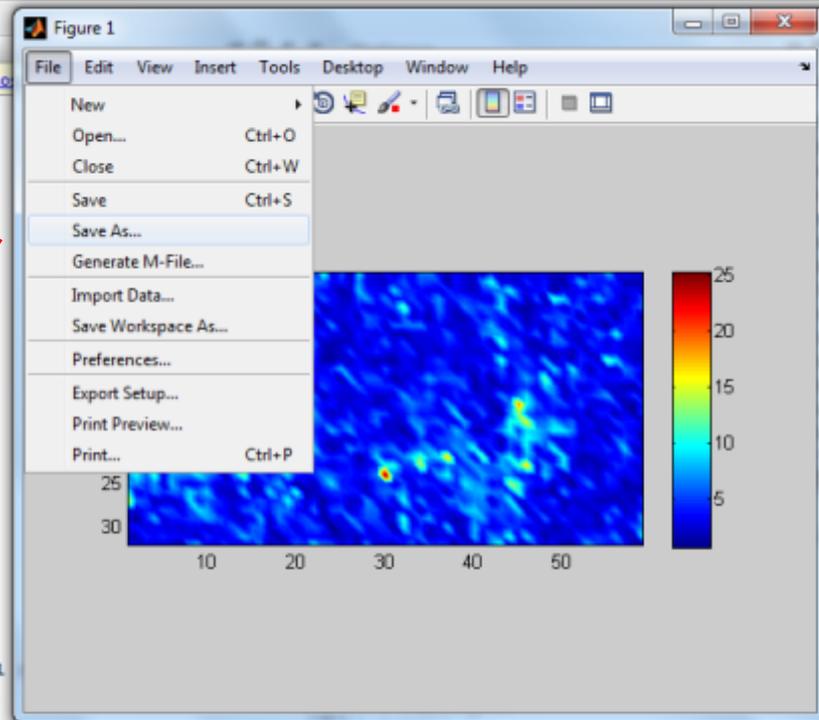
EL9

You can interactively change the scale, simply dragging the color.

```
1 function varargout = Map(varargin)
2 % MAP M-file for Map.fig
3 % MAP, by itself, creates a new
4 % singleton*.
5
6 % H = MAP returns the handle to a new M
7 % the existing singleton*.
8
9 % MAP('CALLBACK', hObject,eventData,hand
10 % function named CALLBACK in MAP.M with
11 %
12 % MAP('Property','Value',...) creates a
13 % existing singleton*. Starting from t
14 %
15 %
16
```

```
maxbkgstd =
10
mindatastd =
20
```

To save your image:
File → Save As.

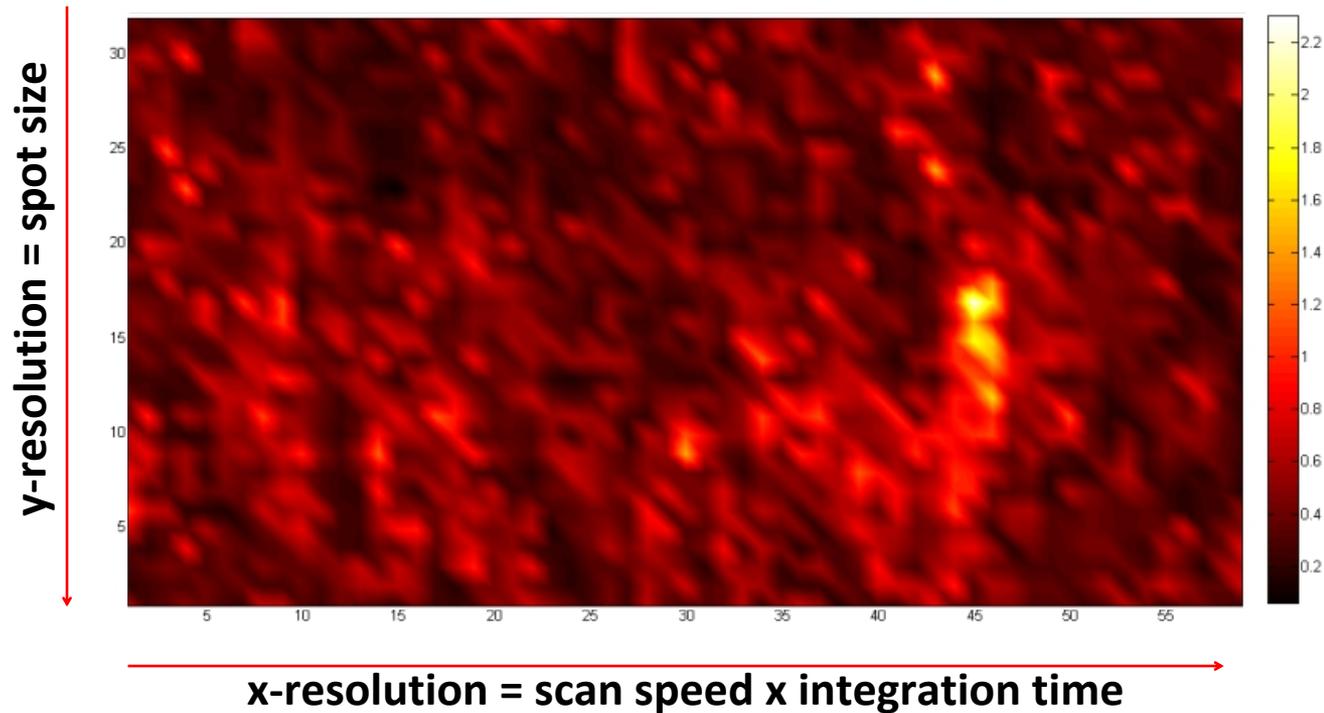


our internal

ou want to map? The answer should be w
another element? yes = 1 no = 0

```
--EL9
-- 26/10/16 13.07 --%
run Map
mapbck_e11
EL9
```

OVR



Y-axis image resolution is equal to the spot size of the laser scans. In this work, we employed e.g. a spot size of 40 μm . X-axis image resolution is equal to the scan speed (20 $\mu\text{m}/\text{s}$, this work) multiplying the integration time (0.644 s, this work). We therefore obtain a x-axis resolution of c.a. 13 μm for the present map.

Since the MapIT maps always have square pixels, the final sizes of the map may not be realistic.

We therefore suggest two different possible approaches.

- 1) Work with the same resolution in both axes, varying for example the scan speed (e.g. 60 $\mu\text{m}/\text{s}$ x 0.644 s = \sim 40 μm) or the spot size.
- 2) Employ the preferred scan speed. Calculate the resulting x-resolution, then resize the image with a graphic software or with MATLAB itself. In this case, with a 40 μm y-resolution and a 13 μm x-resolution, we should shrink the x-axis to the 32.5% ($=13 \cdot 100 / 40$) of its actual size.