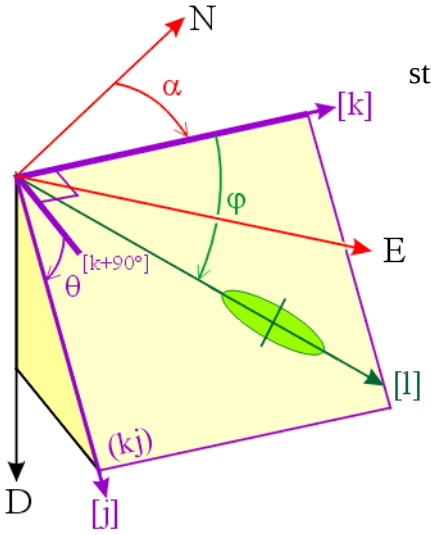
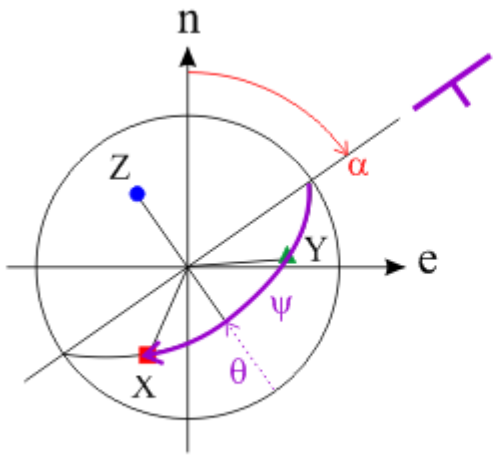
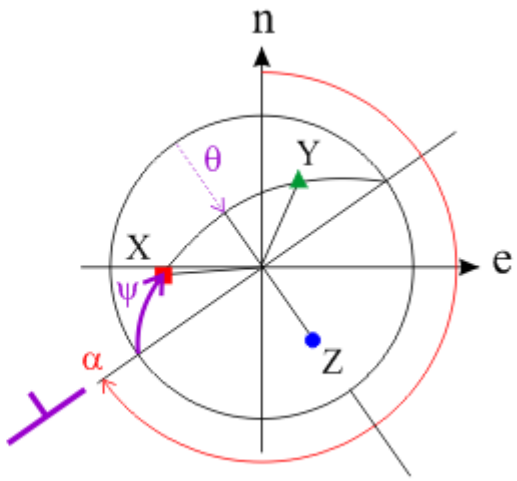
Example of one enclave in the field



strike

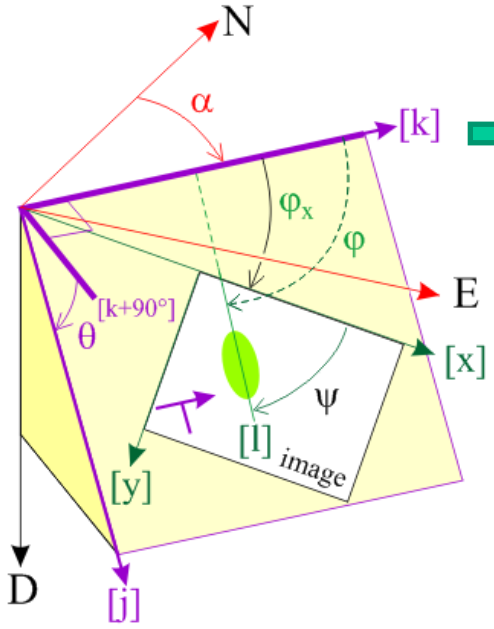
dip



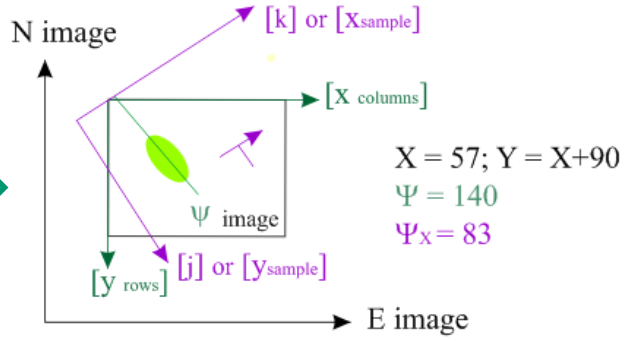


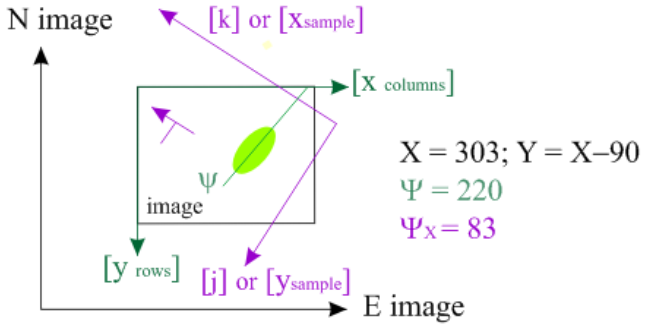
Right hand rule convention of orientation

pitch or rake



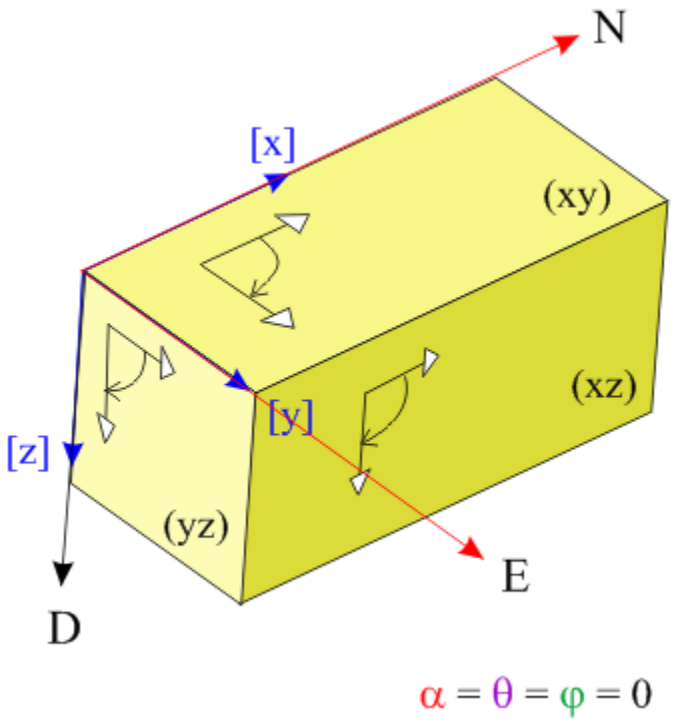
Example of a thin section of rock

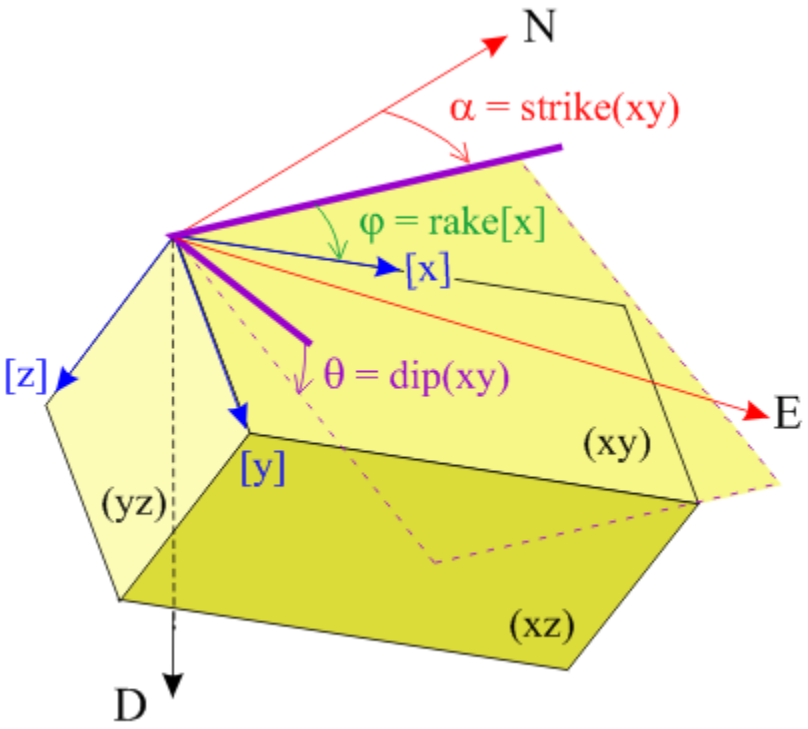




Example of an upside down thin section of rock

Orientation of the 3 faces of a block sample from the orientation of its (xy)face

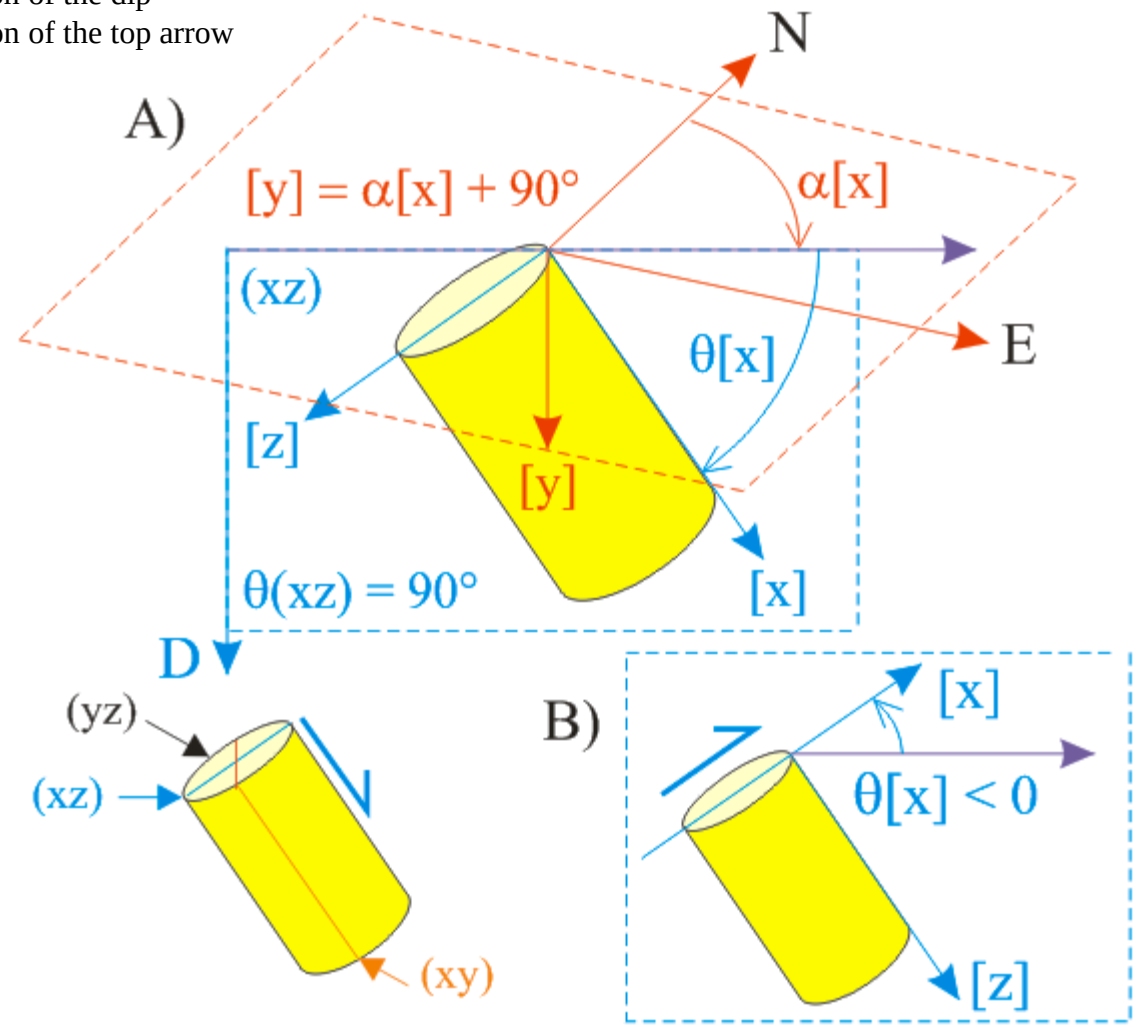


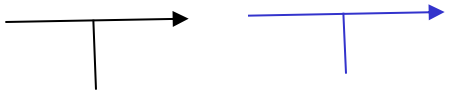


Cutting sections in a core

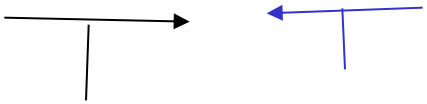
A) With orientation of the dip

B) With orientation of the top arrow

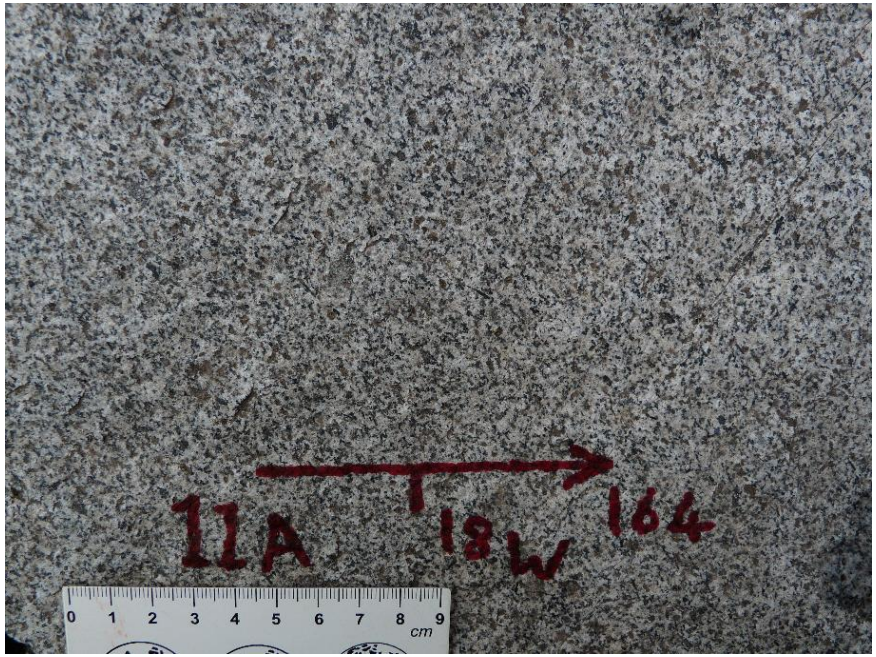


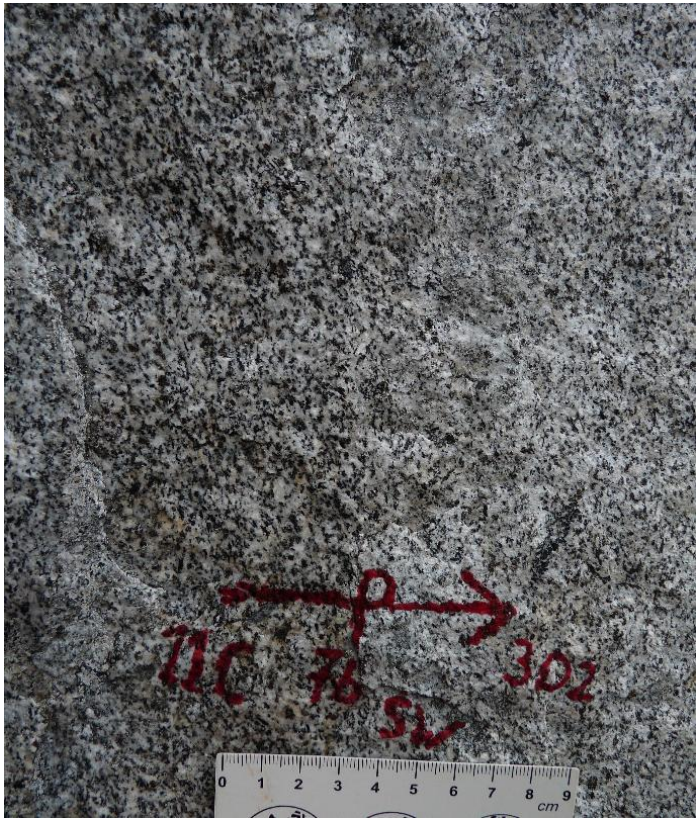


164 W 18 = 164 / 18 dip at + 90

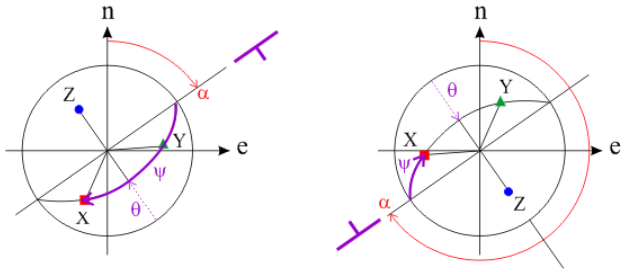


302 SW 76 = 122 / 76 dip at + 90

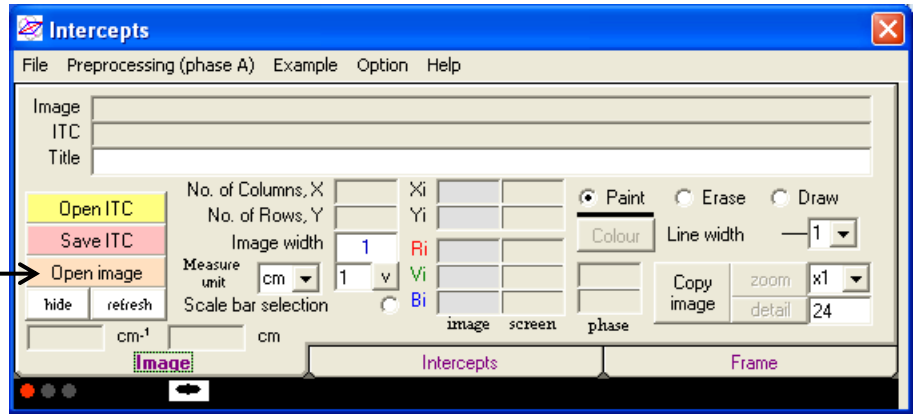


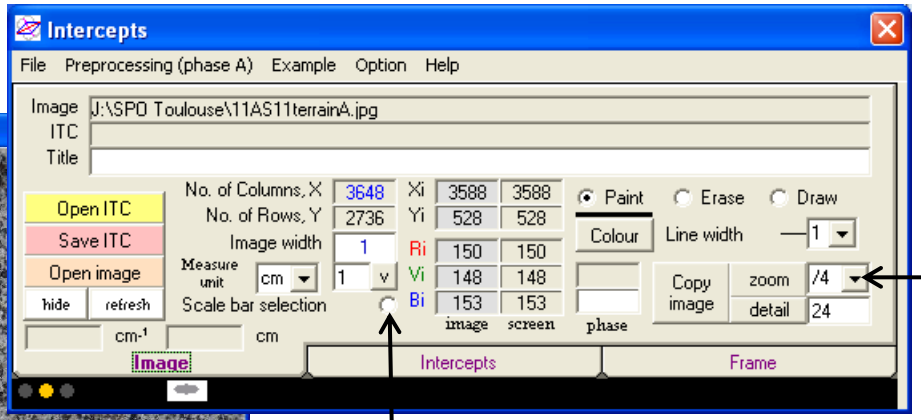


Conversion to the right hand rule

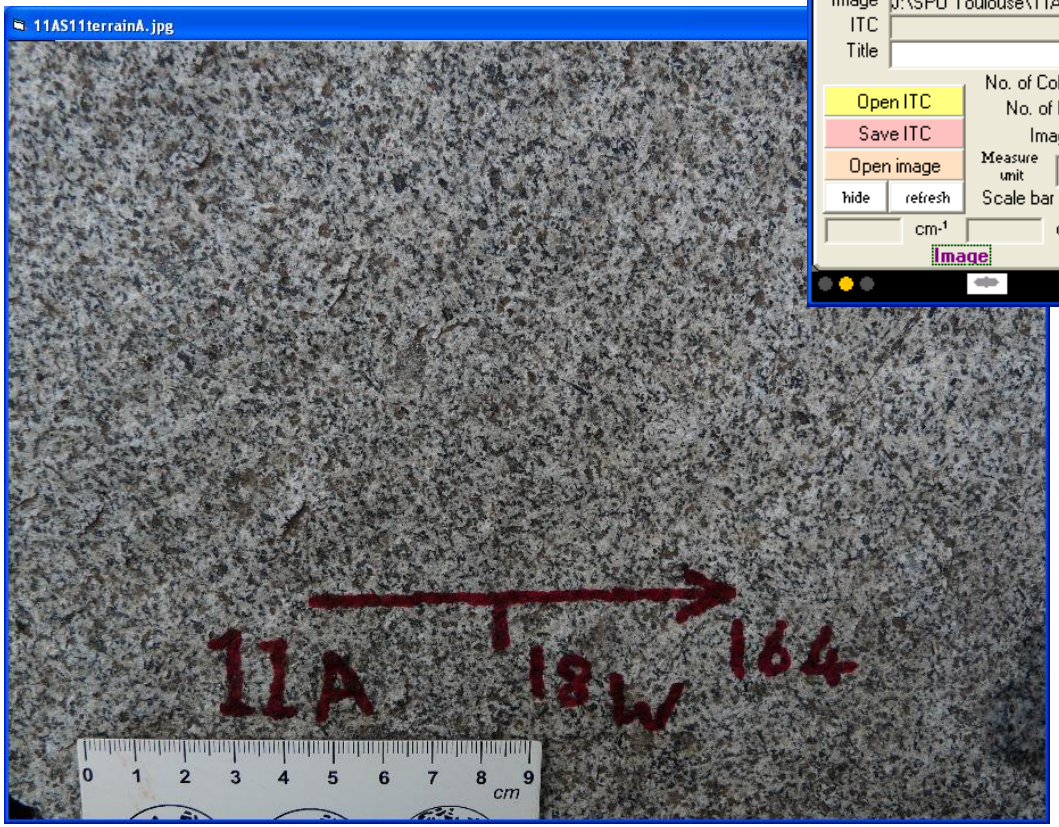


Open image

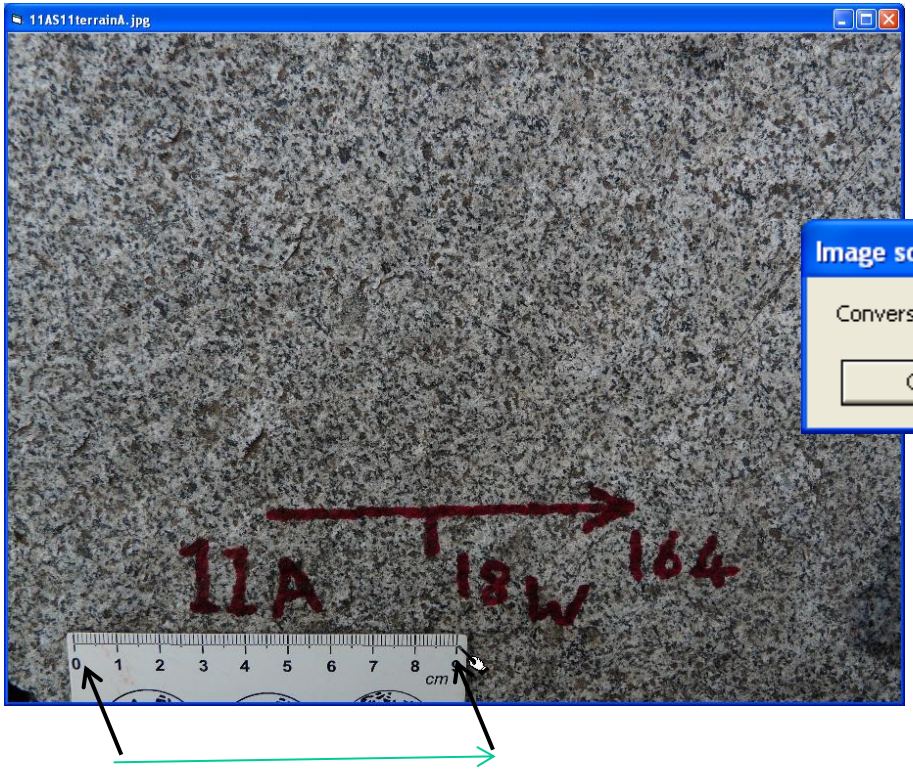


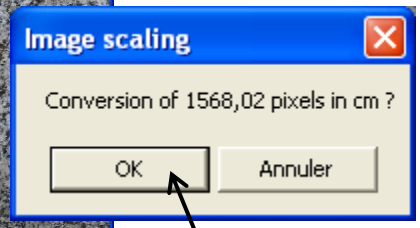


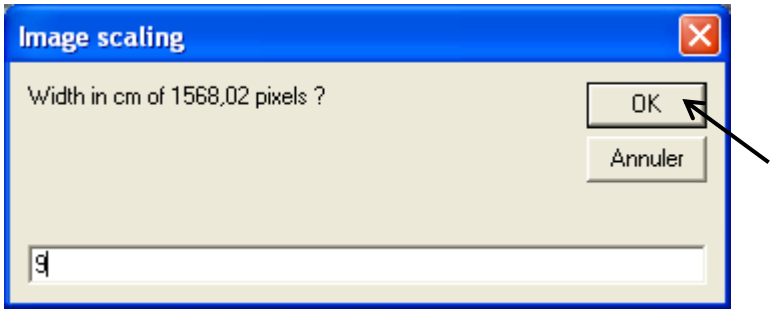
Zoom backward

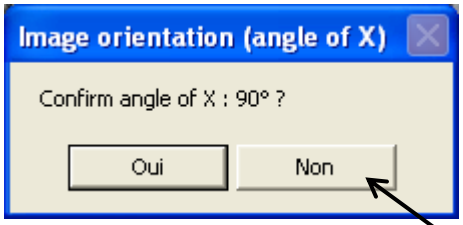


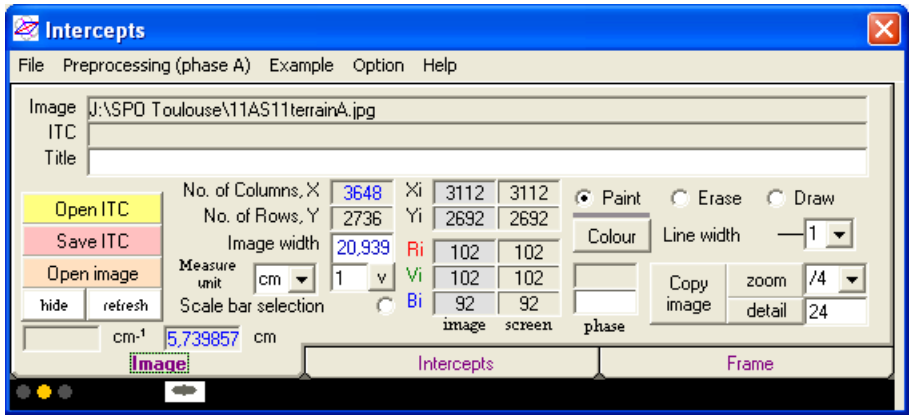
Click on this button to select the scale bar on the image





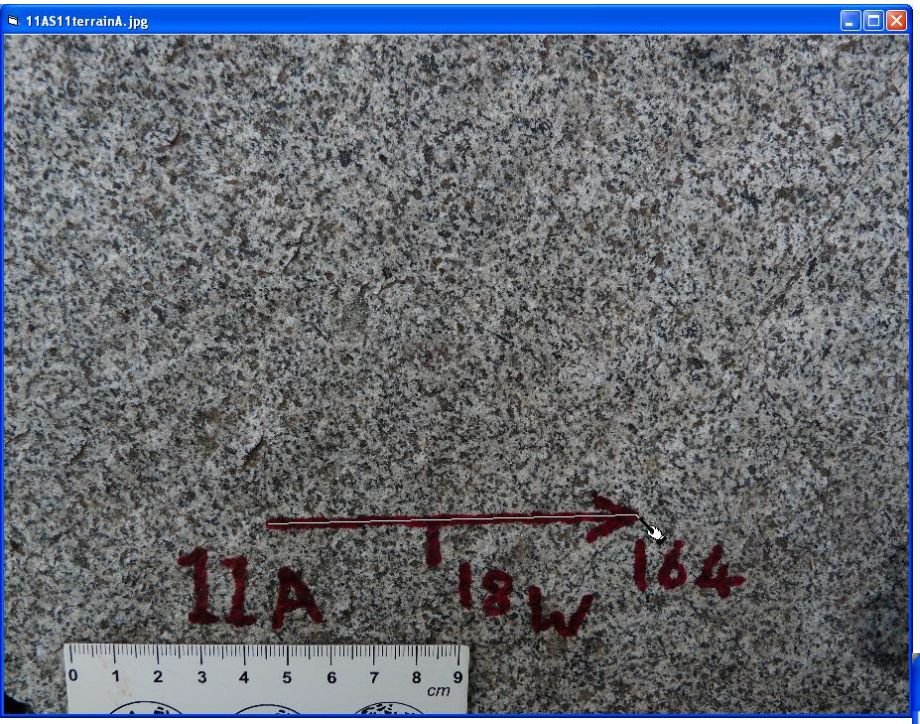


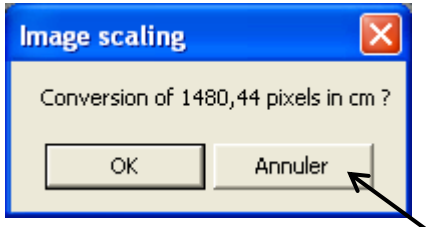


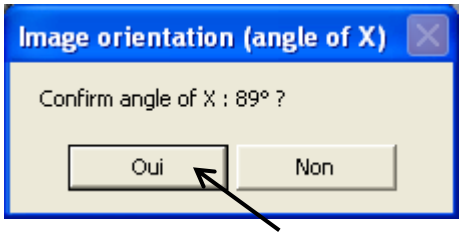


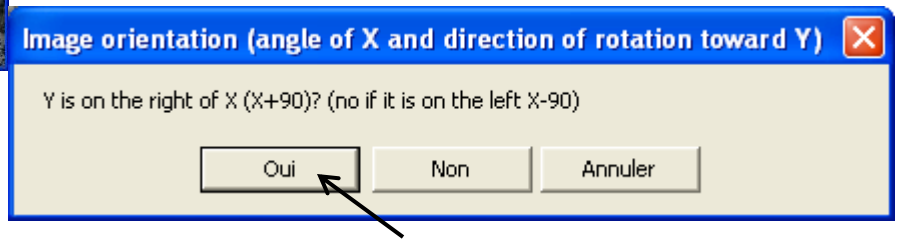
It calculates the image width

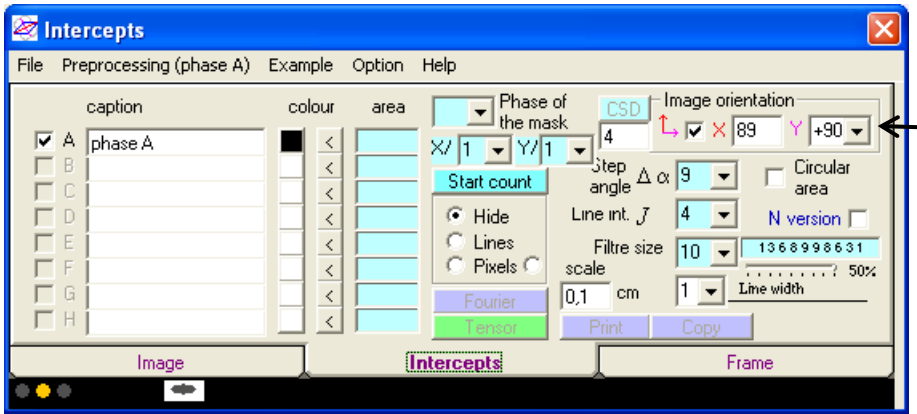
Click again on the button to select the scale bar on the image



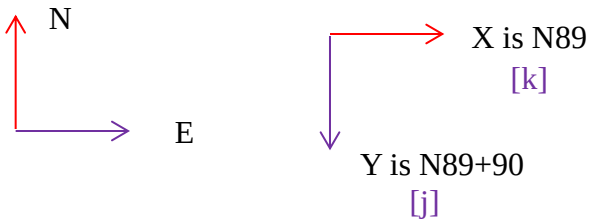


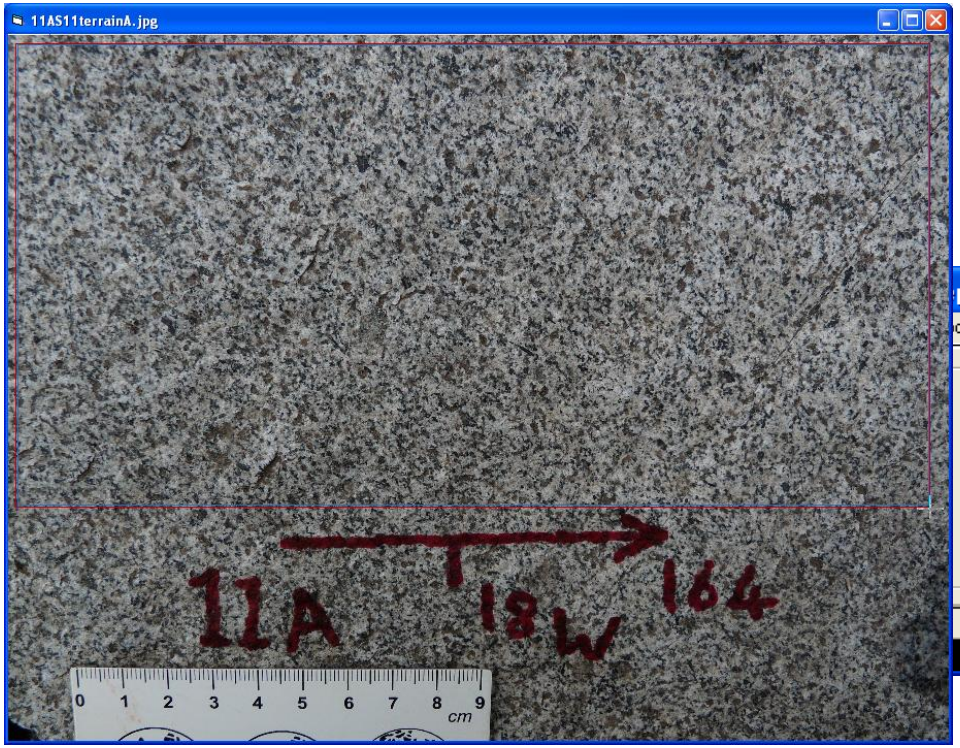


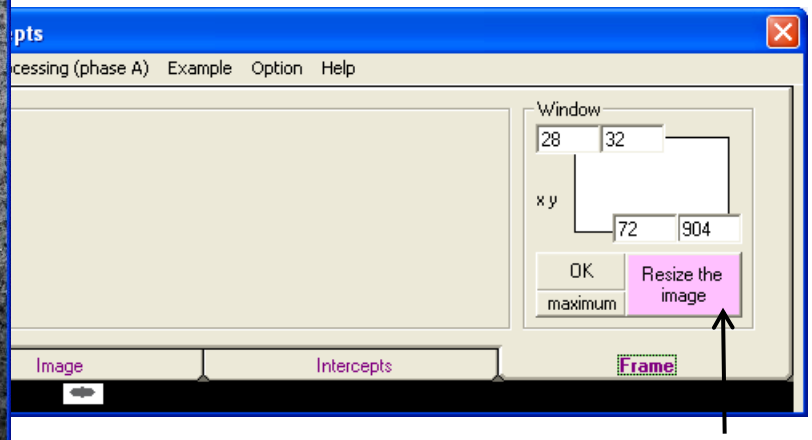




X is now N 89 and Y is at 89+90 in the image

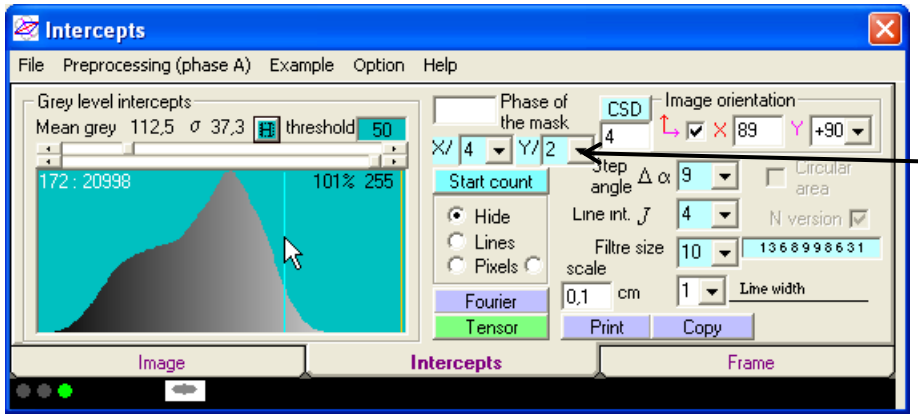






Use frame to resize the image

Activate the calculation in grey levels

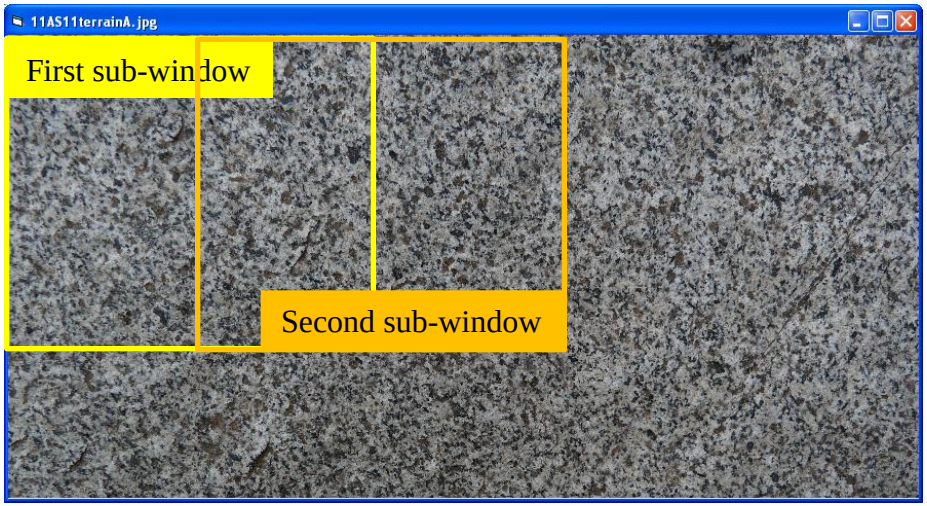


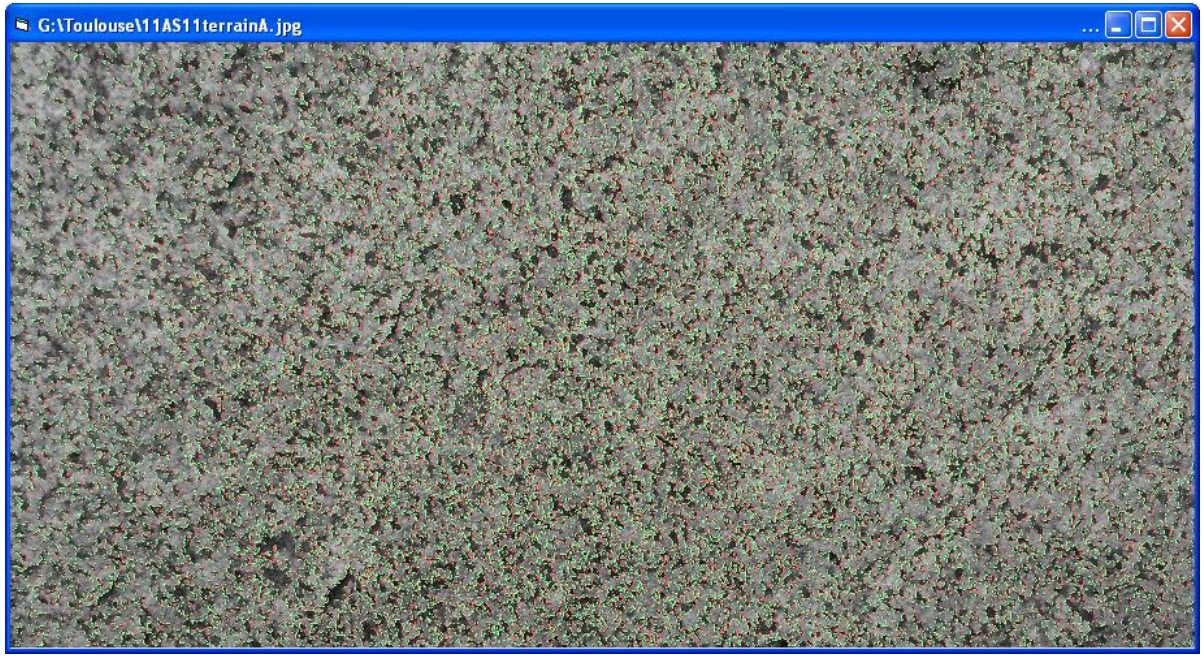
Click on H button to visualize the histogram

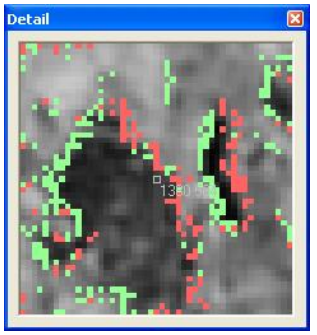
Select the number of sub-windows

Columns X / 4

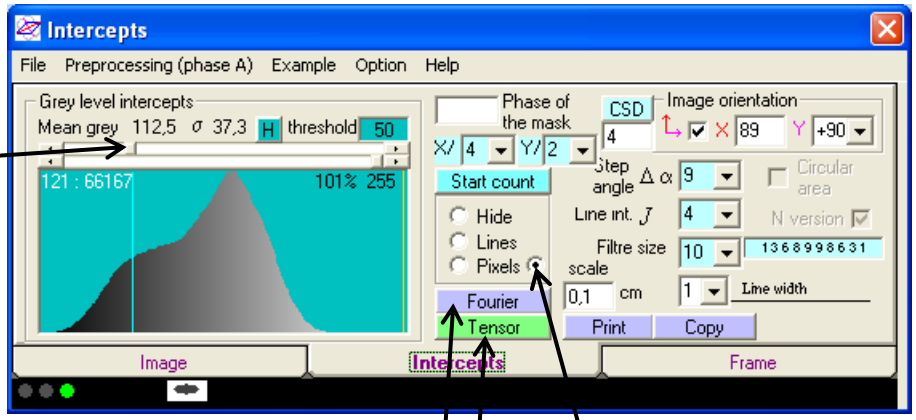
Rows Y / 2







Selection of the grey level detection of intercept : 50
A difference between two pixels greater or equal to 50 grey levels is a boundary



Display the results with Fourier series analysis

Fast calculation by inertia tensor method

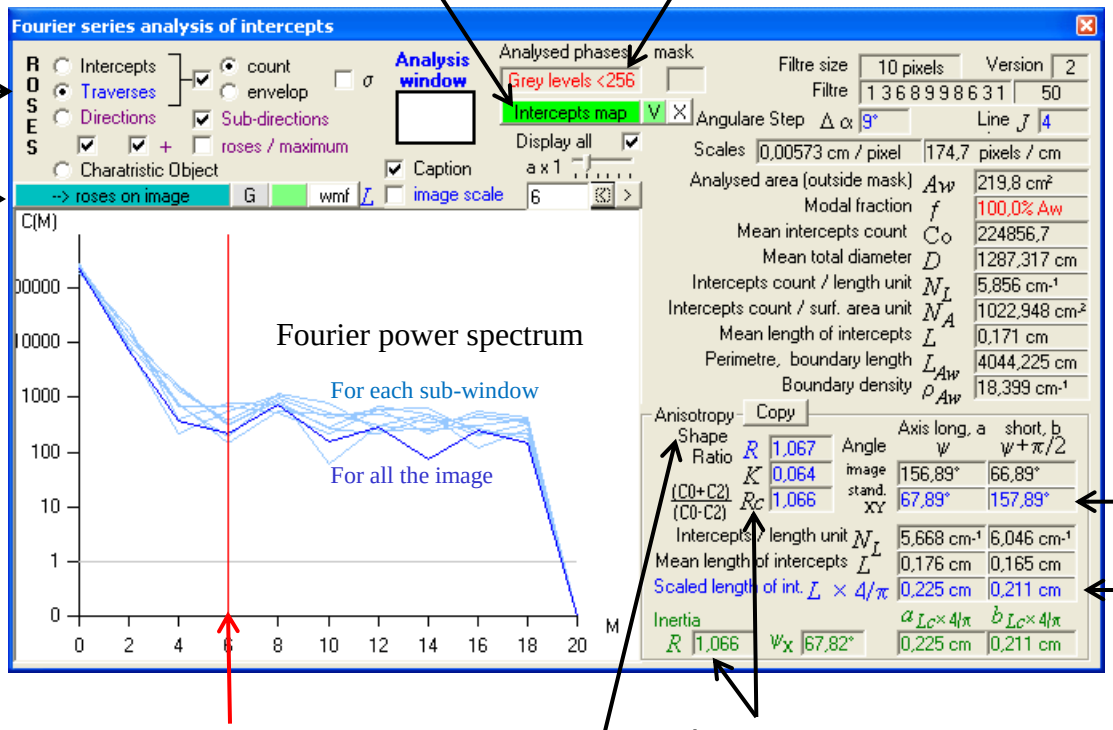
Option visualizing the intercept detection
Like for example with intercepts in and out in green and red

Draw the intercept boundaries on the top of the image; alone (V); delete them (X)

There is only one phase when processing the data in grey levels

Rose diagram selection with display options

Draw the roses on the image; with phases in grey; on the top of intercept boundaries; on a white background with metafile (wmf) recording; with image scale



Angle calculated from the X orientation of the image for exportation to Ellipsoid.exe

Size adjustment assuming that objects are ellipses (not appropriate for rectangular objects)

Anisotropy

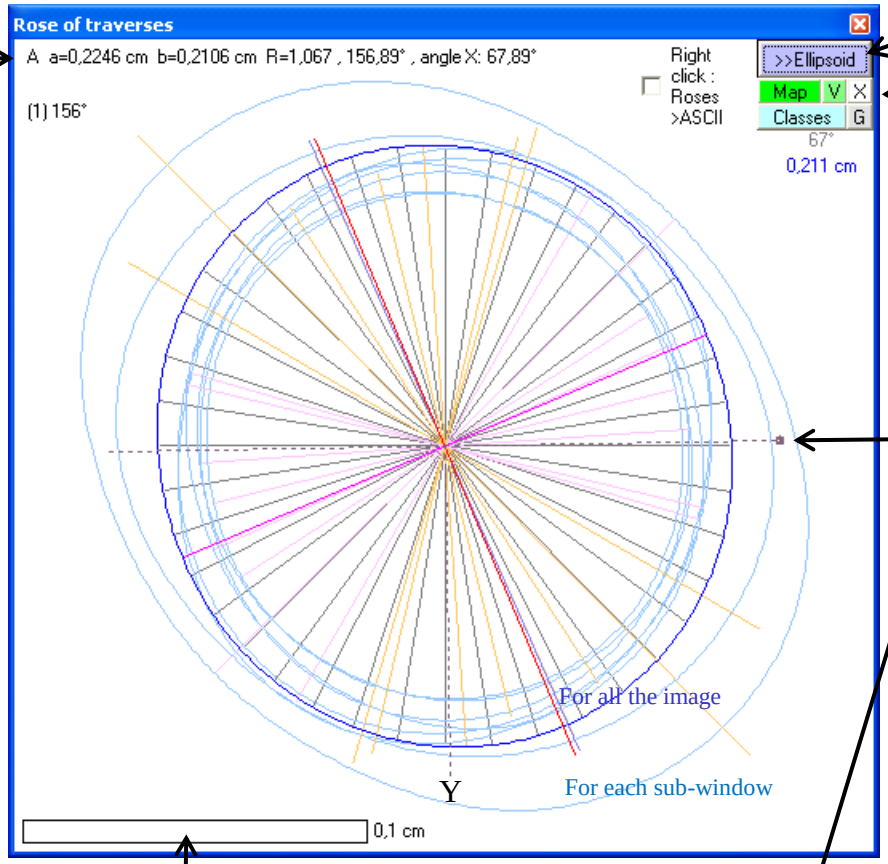
Full shape ratio using power spectrum from 0 to 6

Selection of the number of harmonics used to rebuilt the rose diagrams
6 means that we sum all data from 0 to 6 and 8 to 20 are a blank noise

Mean length intercept rose diagram or rose of traverses

For exportation of the data to Elliposid.exe

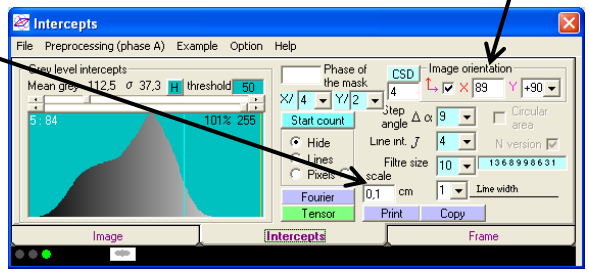
Results



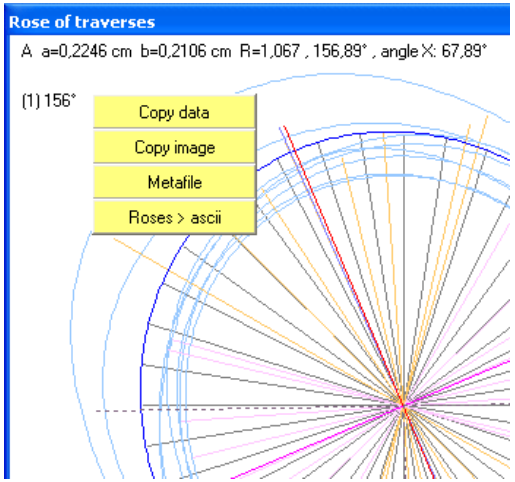
Draw the intercept boundaries on the top of the image; alone (V); delete them (X); with classes colour; with classes in grey

Image orientation X

Scale

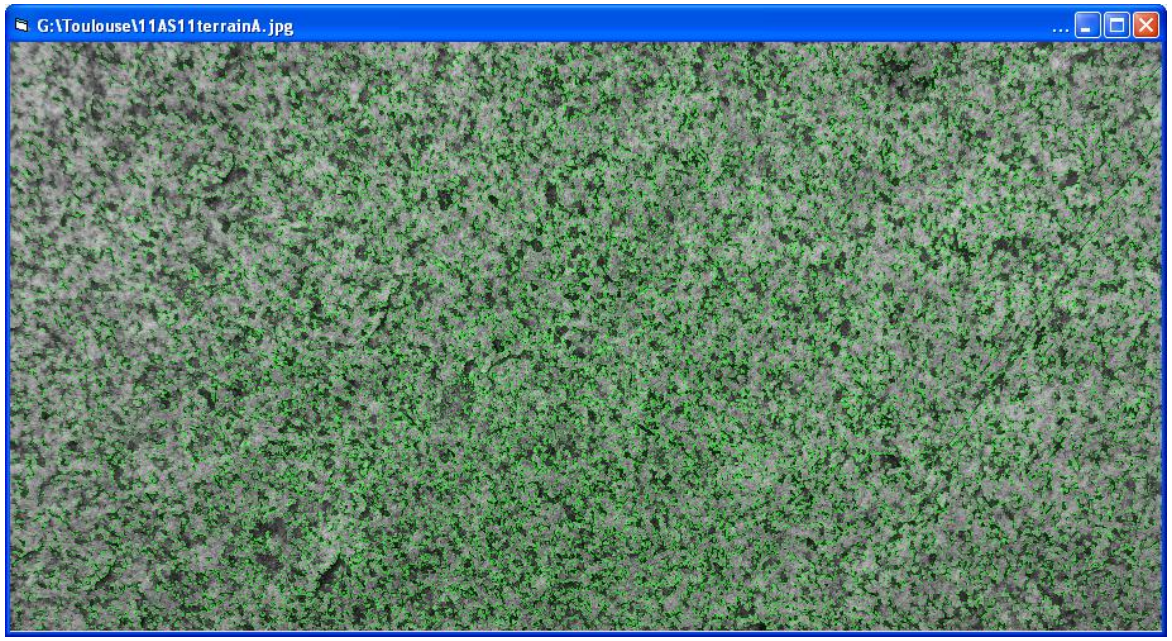


Click with left button to display the following buttons

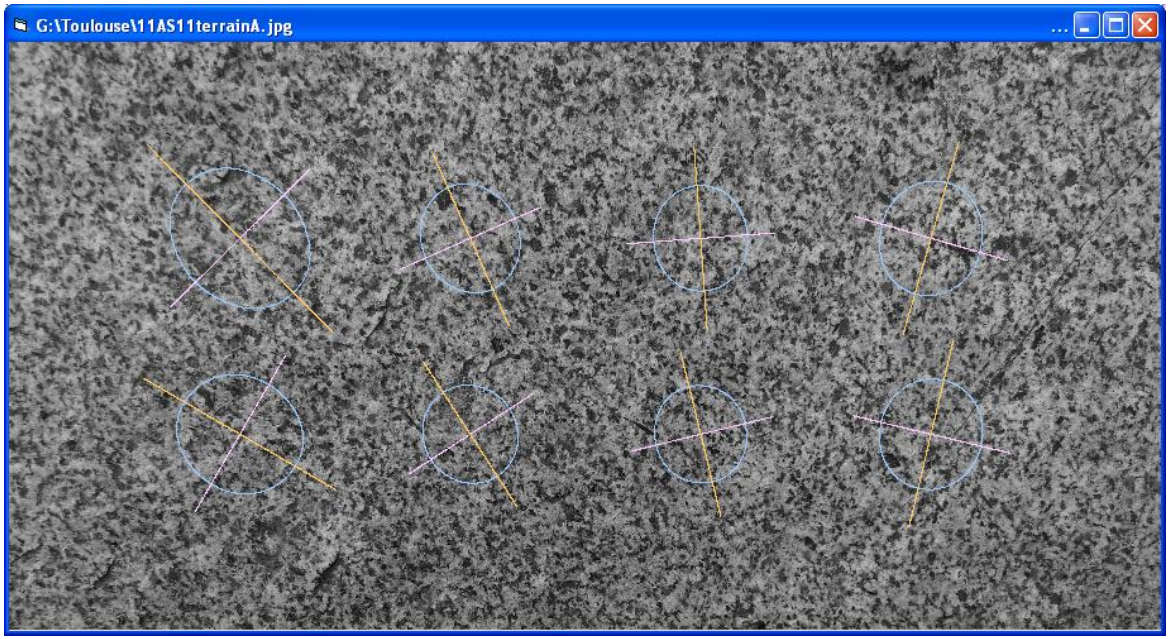


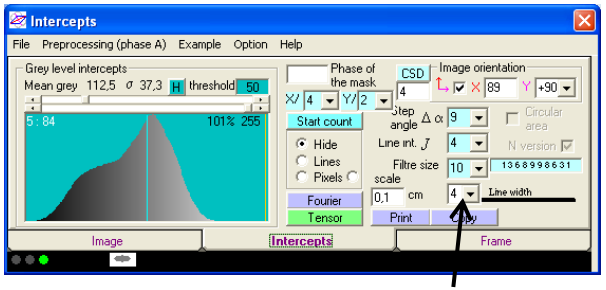
Metafile are compatible with Illustrator, Coreldraw, …

Intercepts map

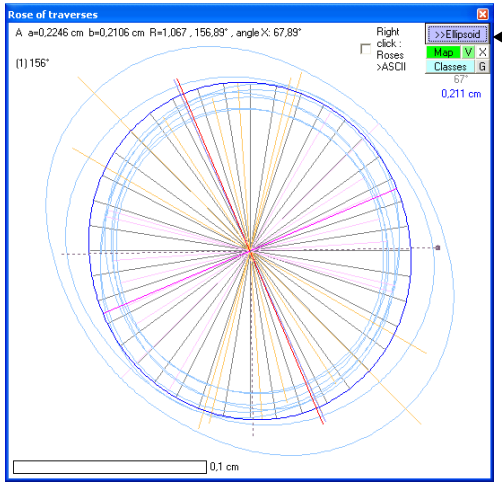


Roses on image

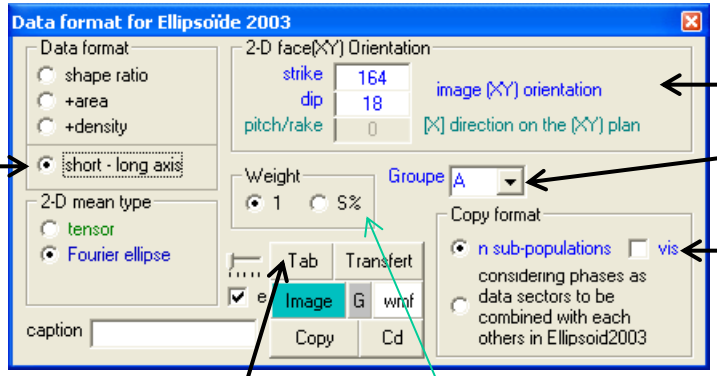




Display with a line width of 4 pixels
to be visible on a zoom / 4



Click on >>Ellipsoid



Data format selection

Start by the image orientation

Group of images to be combined in ellipsoid

Use it to visualize each sub-window in the image

Click on tab to open the table of output; Tranfert to transfert the data; Copy to copy the data
Cd copy also sub-window positions for other purposes

Table

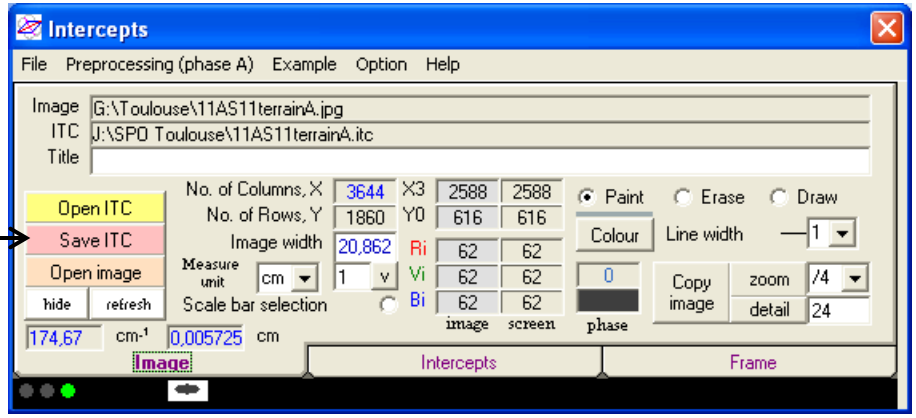
	#	strike	dip	rake	long axis	short axis	weight	xc	yc
1	1_A	164	18	46,331	0,292344	0,238919	1	728,80	620,00
2	2_A	164	18	67,108	0,212886	0,187021	1	1457,60	620,00
3	3_A	164	18	86,882	0,202492	0,180606	1	2186,40	620,00
4	4_A	164	18	107,174	0,222036	0,194771	1	2915,20	620,00
5	5_A	164	18	31,148	0,245641	0,220170	1	728,80	1240,00
6	6_A	164	18	58,194	0,190721	0,180309	1	1457,60	1240,00
7	7_A	164	18	77,182	0,187691	0,175889	1	2186,40	1240,00
8	8_A	164	18	104,323	0,213017	0,196718	1	2915,20	1240,00

Coordinates of the sub-windows not used in Ellipsoid

You may add a caption that will be printed between the sub-window number and the code of image group

Click on S% to weight each data to its surface area %

Save your work with all the orientations and the image compressed in "packbit" with 8 bits per pixel (grey level or phase color code)



Then open Elliposoid.exe

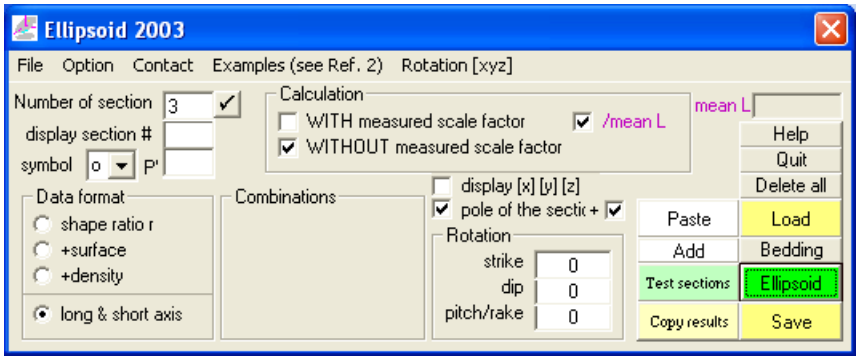
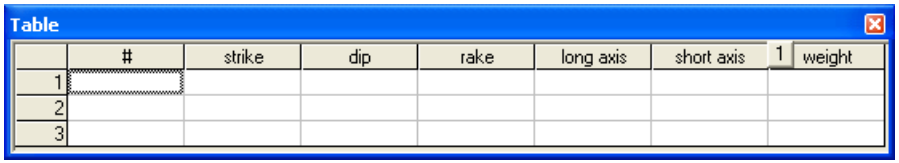


Table for input data



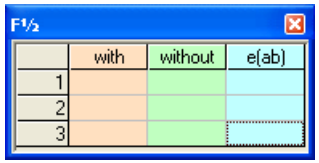
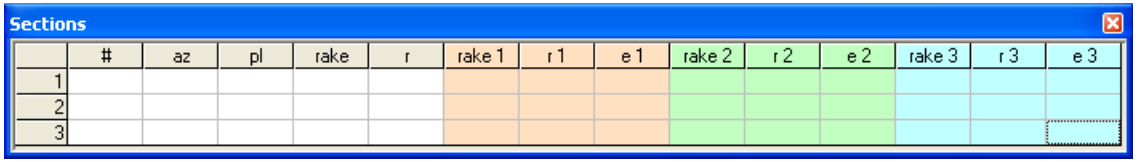
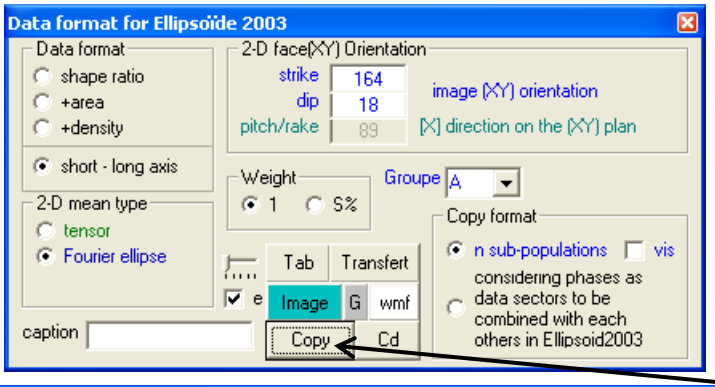


Table of 2D ellipse compatibility with 3D ellipsoid

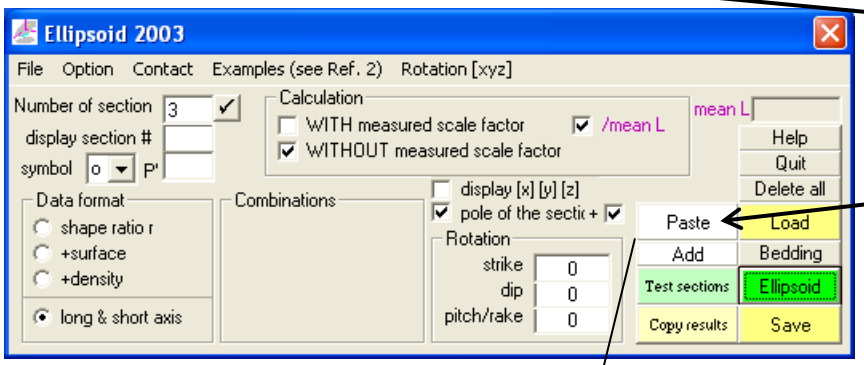
Table of comparison between shape ratio r and orientation rake of input data and output results for each image section (number, azimuth, plunge)



Results 1 with scale factors; 2 without scale factors; 3 with simple averaging on perpendicular sections. e is an error estimate given by the vector linking input and output long axes



Click on Copy (Intercepts)



Immediately after the Copy in Intercepts, click on Paste for the first image

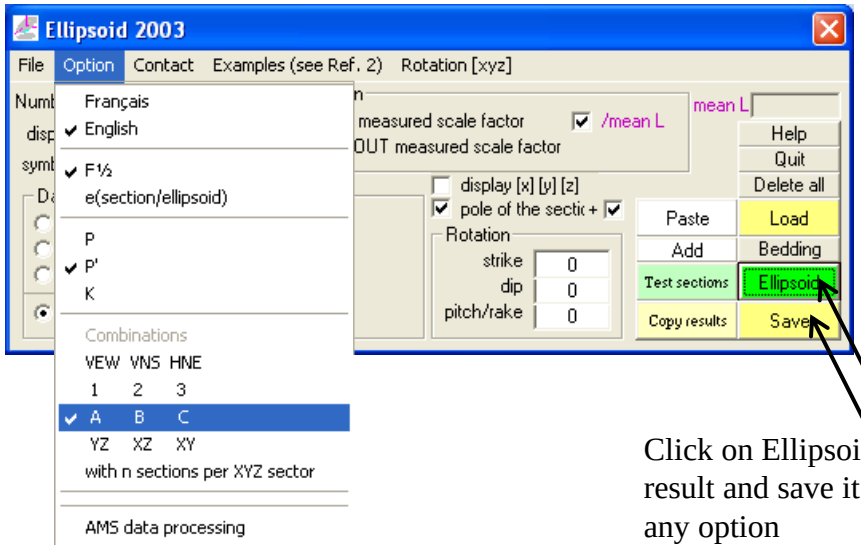
Table

	#	strike	dip	rake	long axis	short axis	1	weight
1	1_A	164	18	46,331	0,292344	0,238919		1
2	2_A	164	18	67,108	0,212886	0,187021		1
3	3_A	164	18	86,882	0,202492	0,180606		1
4	4_A	164	18	107,174	0,222036	0,194771		1
5	5_A	164	18	31,148	0,245641	0,220170		1
6	6_A	164	18	58,194	0,190721	0,180309		1
7	7_A	164	18	77,182	0,187691	0,175889		1
8	8_A	164	18	104,323	0,213017	0,196718		1

Then click on Add for the following images

Table

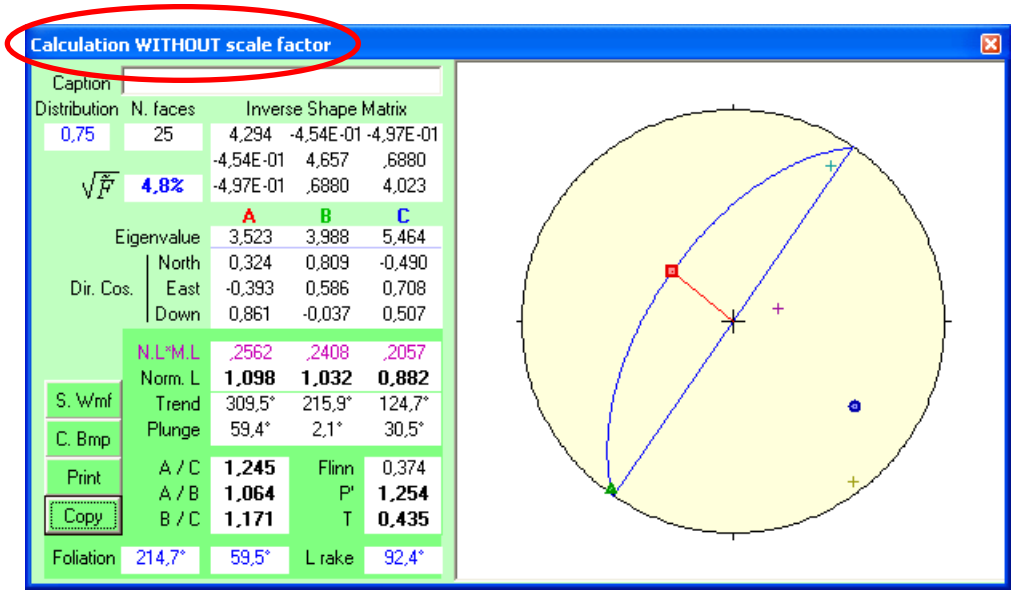
	#	strike	dip	rake	long axis	short axis	1	weight
1	1_A	164	18	46,331	0,292344	0,238919		1
2	2_A	164	18	67,108	0,212886	0,187021		1
3	3_A	164	18	86,882	0,202492	0,180606		1
4	4_A	164	18	107,174	0,222036	0,194771		1
5	5_A	164	18	31,148	0,245641	0,220170		1
6	6_A	164	18	58,194	0,190721	0,180309		1
7	7_A	164	18	77,182	0,187691	0,175889		1
8	8_A	164	18	104,323	0,213017	0,196718		1
9	1_B	233	84	21,038	0,255225	0,236516		1
10	2_B	233	84	69,989	0,231758	0,218821		1
11	3_B	233	84	79,430	0,234461	0,217089		1
12	4_B	233	84	63,696	0,265657	0,248884		1
13	5_B	233	84	19,797	0,255281	0,236882		1
14	6_B	233	84	48,419	0,226562	0,211807		1
15	7_B	233	84	57,386	0,224815	0,214955		1
16	8_B	233	84	46,811	0,257021	0,240650		1
17	1_C	122	76	120,700	0,469349	0,303722		1
18	2_C	122	76	113,727	0,300594	0,225036		1
19	3_C	122	76	106,635	0,265071	0,213949		1
20	4_C	122	76	123,777	0,314284	0,237607		1
21	5_C	122	76	120,466	0,231947	0,190056		1
22	6_C	122	76	116,224	0,208138	0,179220		1
23	7_C	122	76	122,482	0,291159	0,239400		1
24	8_C	122	76	121,932	0,226607	0,188581		1
25	9_C	122	76	120,180	0,193104	0,165927		1



Click on Ellipsoid to display the first result and save it before selecting any option

F½

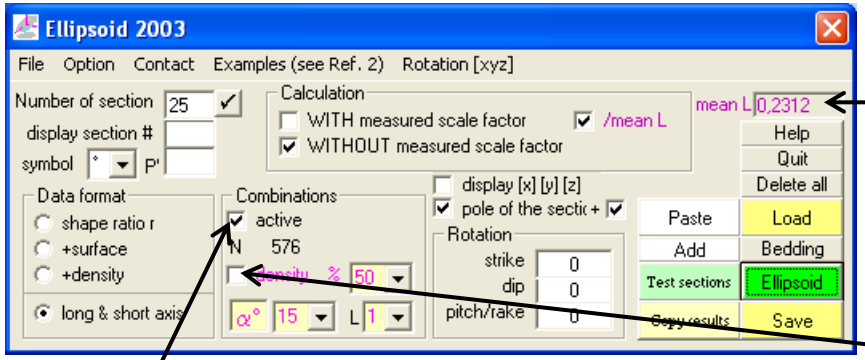
	with	without	e(ab)
1 A		11,7%	
2 A		3,6%	
3 A		5,6%	
4 A		11,1%	
5 A		9,3%	
6 A		2,9%	
7 A		2,4%	
8 A		7,7%	
9 B		6,2%	
10 B		1,7%	
11 B		3,8%	
12 B		0,9%	
13 B		6,3%	
14 B		1,7%	
15 B		1,3%	
16 B		2,0%	
17 C		15,4%	
18 C		7,5%	
19 C		8,5%	
20 C		5,5%	
21 C		1,1%	
22 C		5,6%	
23 C		1,8%	
24 C		2,5%	
25 C		5,0%	



Sections

	#	az	pl	rake	r	rake 1	r 1	e 1	rake 2	r 2	e 2	rake 3	r 3	e 3
1	1_A	164,0	18,0	46,3	1,224				67,9	1,088	14,0%			
2	2_A	164,0	18,0	67,1	1,138				67,9	1,088	4,9%			
3	3_A	164,0	18,0	86,9	1,121				67,9	1,088	4,6%			
4	4_A	164,0	18,0	107,2	1,140				67,9	1,088	8,7%			
5	5_A	164,0	18,0	31,1	1,116				67,9	1,088	6,6%			
6	6_A	164,0	18,0	58,2	1,058				67,9	1,088	3,1%			
7	7_A	164,0	18,0	77,2	1,067				67,9	1,088	2,3%			
8	8_A	164,0	18,0	104,3	1,083				67,9	1,088	5,1%			
9	1_B	233,0	84,0	21,0	1,079				58,7	1,064	4,7%			
10	2_B	233,0	84,0	70,0	1,059				58,7	1,064	1,3%			
11	3_B	233,0	84,0	79,4	1,080				58,7	1,064	3,0%			
12	4_B	233,0	84,0	63,7	1,067				58,7	1,064	0,7%			
13	5_B	233,0	84,0	19,8	1,078				58,7	1,064	4,7%			
14	6_B	233,0	84,0	48,4	1,070				58,7	1,064	1,3%			
15	7_B	233,0	84,0	57,4	1,046				58,7	1,064	1,7%			
16	8_B	233,0	84,0	46,8	1,068				58,7	1,064	1,4%			
17	1_C	122,0	76,0	120,7	1,545				120,6	1,238	27,4%			
18	2_C	122,0	76,0	113,7	1,336				120,6	1,238	9,2%			
19	3_C	122,0	76,0	106,6	1,239				120,6	1,238	5,2%			
20	4_C	122,0	76,0	123,8	1,323				120,6	1,238	7,7%			
21	5_C	122,0	76,0	120,5	1,220				120,6	1,238	1,6%			
22	6_C	122,0	76,0	116,2	1,161				120,6	1,238	7,0%			
23	7_C	122,0	76,0	122,5	1,216				120,6	1,238	2,1%			
24	8_C	122,0	76,0	121,9	1,202				120,6	1,238	3,3%			
25	9_C	122,0	76,0	120,2	1,164				120,6	1,238	6,6%			

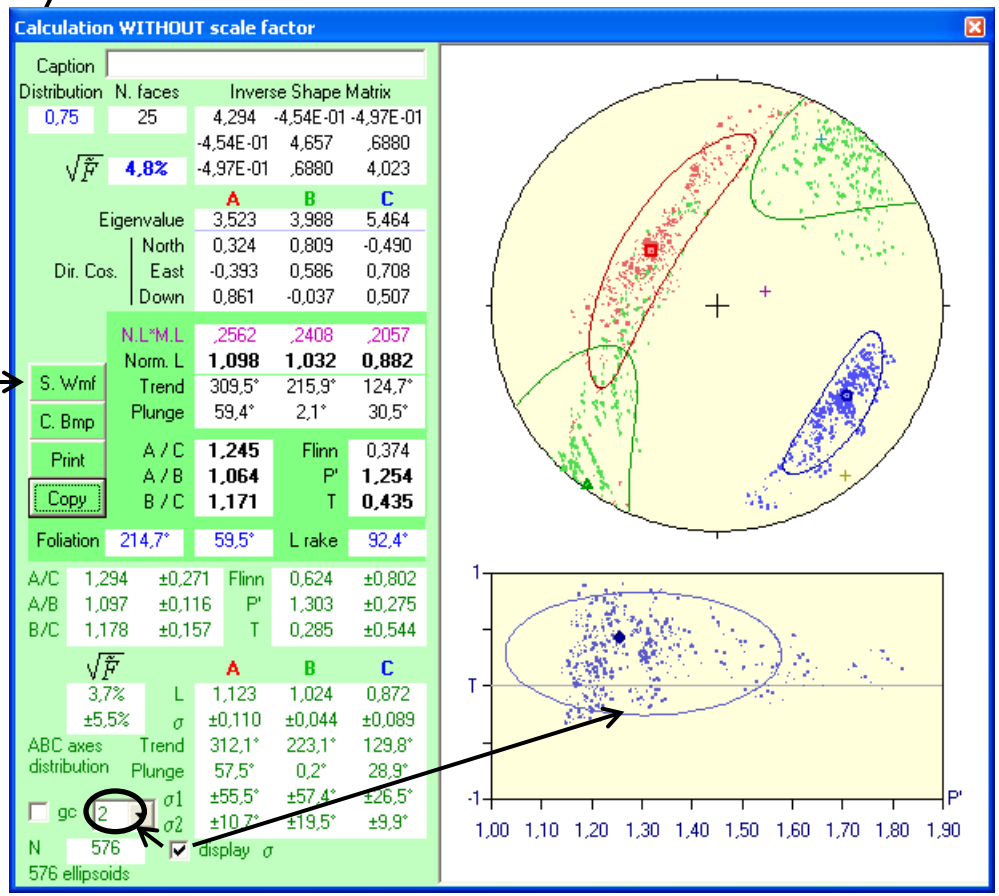
N.L*M.L : normalized length (in arbitrary unit) times mean length (in metric unit)



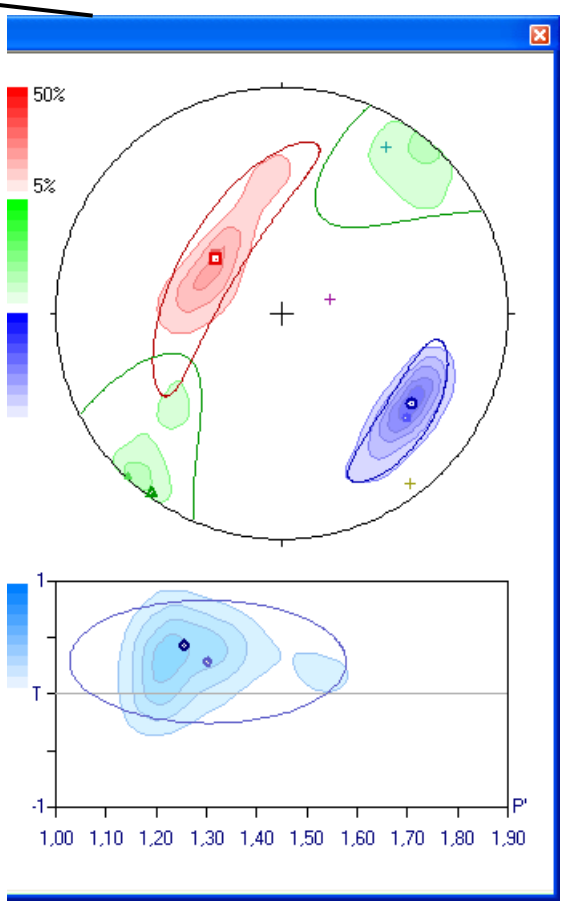
Mean length given by the input data

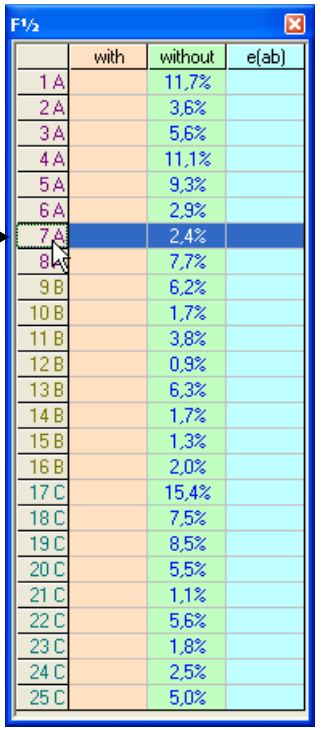
/mean L by avoiding overflow facilitate the calculation of eigenvalues

The density calculation may be time consuming



To export the plot in a metafile

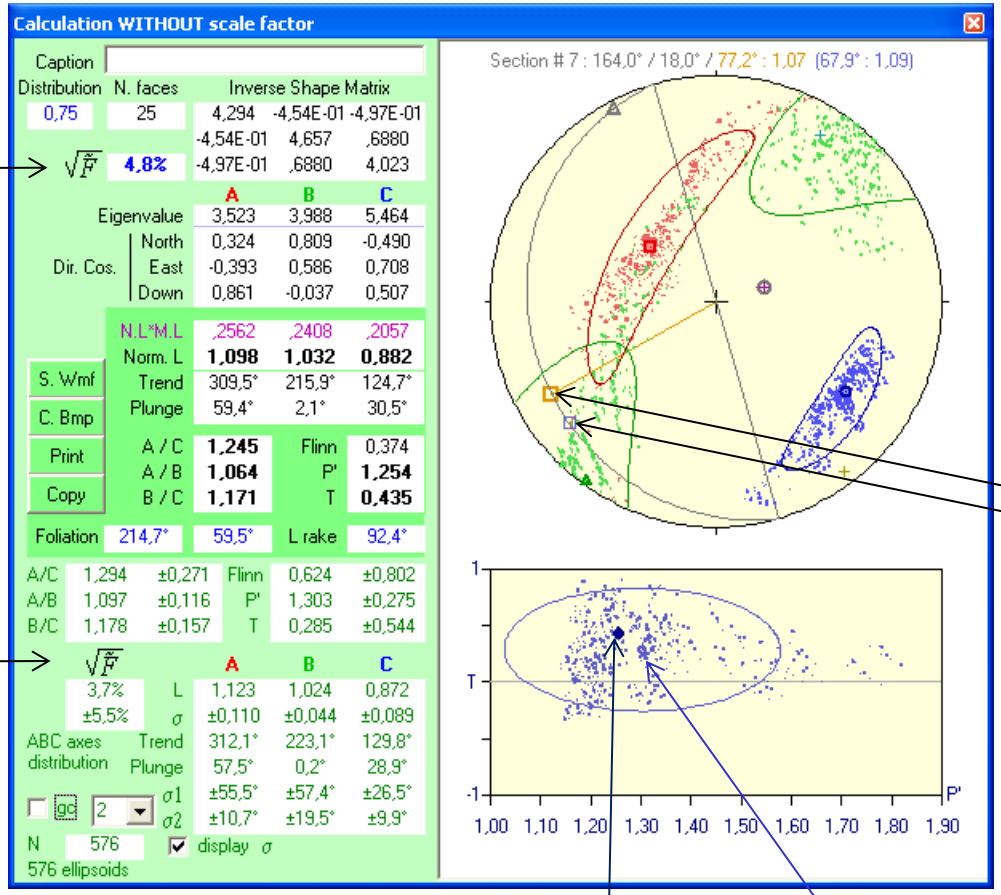




Click on this row to display the data of this section in the graphic

Order number; azimuth, pitch, shape ratio (ellipse pitch, shape ratio)

F ½ : compatibility index between all 2D ellipsoidal sections and the 3D ellipsoid



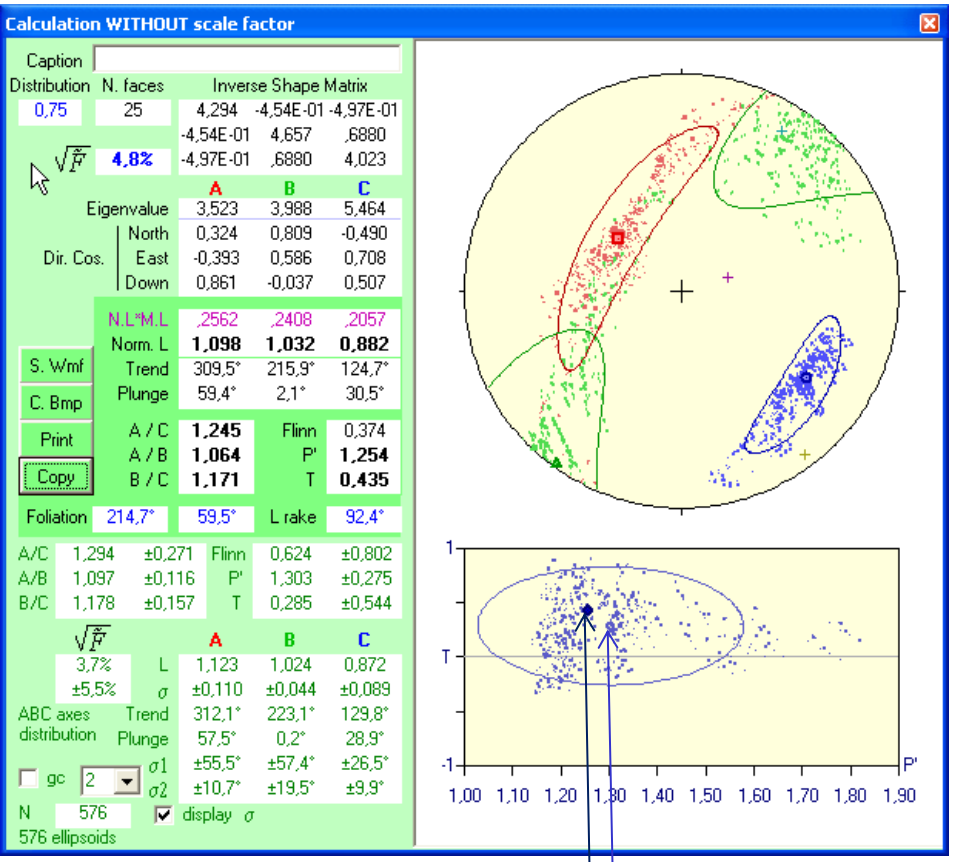
Mean F ½ : compatibility index between 2D ellipsoidal sections and the 576 intermediate 3D ellipsoid

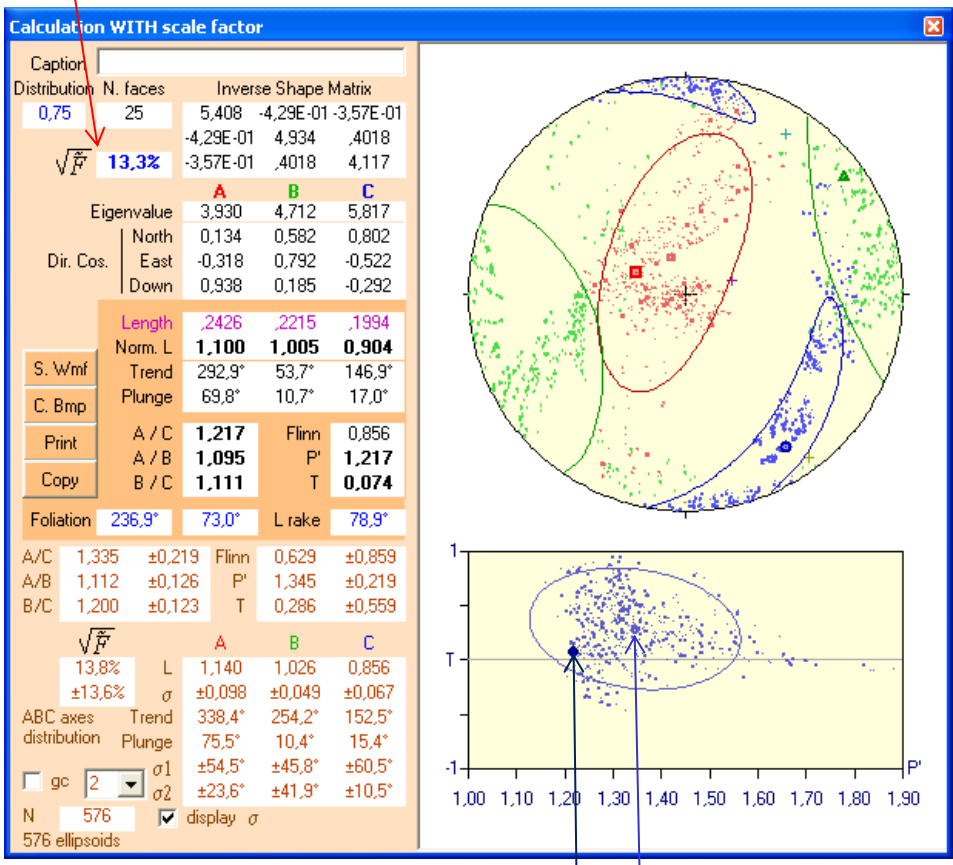
Input data long axis
Long axis found on the section of the ellipsoid
(F ½ =2.4% and e=2.3%)

Check the consistency between the full ellipsoid and the mean ellipsoid of the 576 combinations of sub-windows.

Be careful when using scale factor!

A strong F ½ indicates that sizes may be wrong (not consistent between images)





Consistent P' parameters

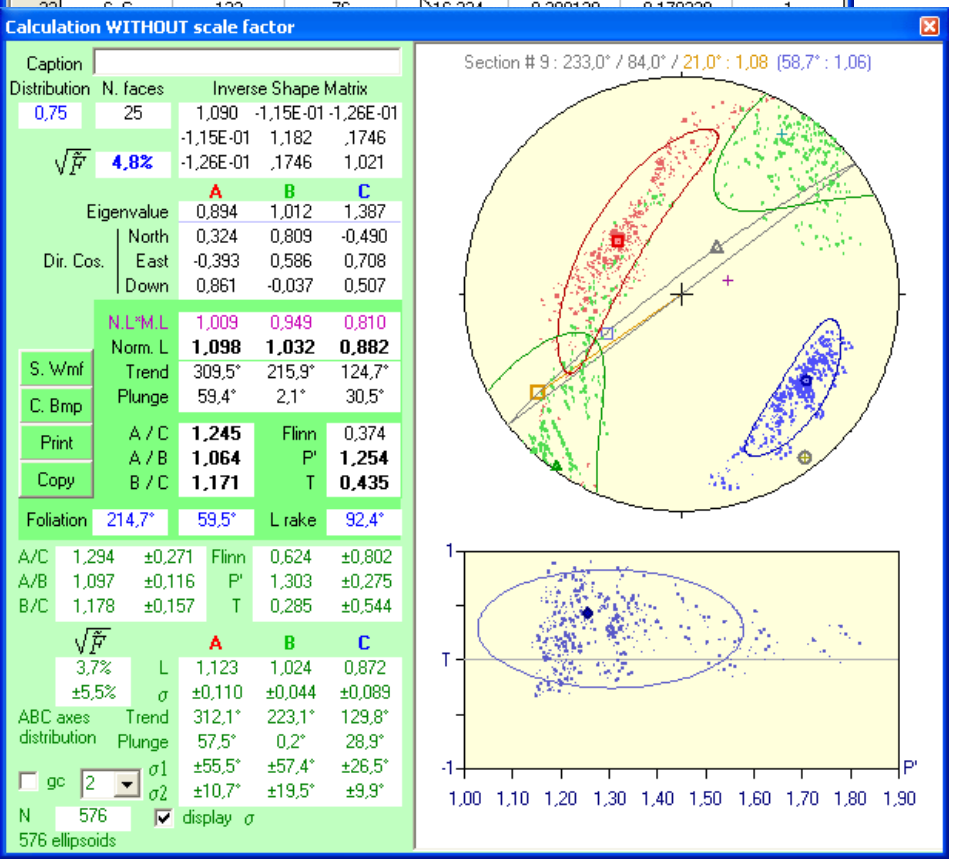
Not consistent P' parameters
The full ellipsoid P' is not in the center of the could of subdata

Table

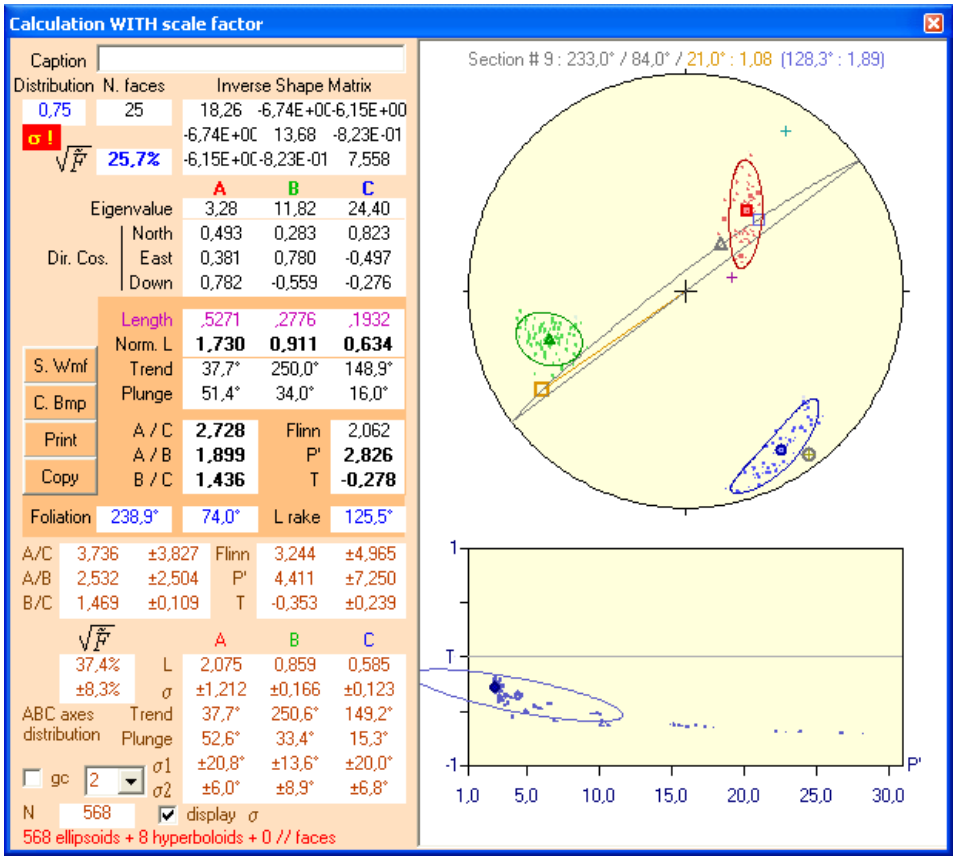
	#	strike	dip	rake	long axis	short axis	weight
1	1_A	164	18	46,331	0,292344	0,238919	1
2	2_A	164	18	67,108	0,212886	0,187021	1
3	3_A	164	18	86,882	0,202492	0,180606	1
4	4_A	164	18	107,174	0,222036	0,194771	1
5	5_A	164	18	31,148	0,245641	0,220170	1
6	6_A	164	18	58,194	0,190721	0,180309	1
7	7_A	164	18	77,182	0,187691	0,175889	1
8	8_A	164	18	104,323	0,213017	0,196718	1
9	1_B	233	84	21,038	2,55225	2,36516	1
10	2_B	233	84	69,989	2,31758	2,18821	1
11	3_B	233	84	79,430	2,34461	2,17089	1
12	4_B	233	84	63,696	2,65657	2,48884	1
13	5_B	233	84	19,797	2,55281	2,36882	1
14	6_B	233	84	48,419	2,26562	2,11807	1
15	7_B	233	84	57,386	2,24815	2,14955	1
16	8_B	233	84	46,811	2,57021	2,40650	1
17	1_C	122	76	120,700	0,469349	0,303722	1
18	2_C	122	76	113,727	0,300594	0,225036	1
19	3_C	122	76	106,635	0,265071	0,213949	1
20	4_C	122	76	123,777	0,314284	0,237607	1
21	5_C	122	76	120,466	0,231947	0,190056	1

The sizes of the long and short axes of the B section have been multiplied by 10 to show that calculation with a wrong scale factor may give false results whereas calculation without scale factor remains correct.

Calculation WITHOUT scale factor



Calculation WITH scale factor



The gathering of directions along A, B and C is due to an intersection effect which force those directions to rotate toward the image plans or their poles.
Such error can be detected by anomalous standard deviations, hyperboloids or strong F ½ (25% and mean at 37% here).