

6th ADVANCED COURSE

ON RADAR POLARIMETRY 2021

PolSARpro v6 (Biomass Edition)

Practical session – part 2

Advanced Concepts

POTTIER Eric

IETR / University of Rennes 1, France

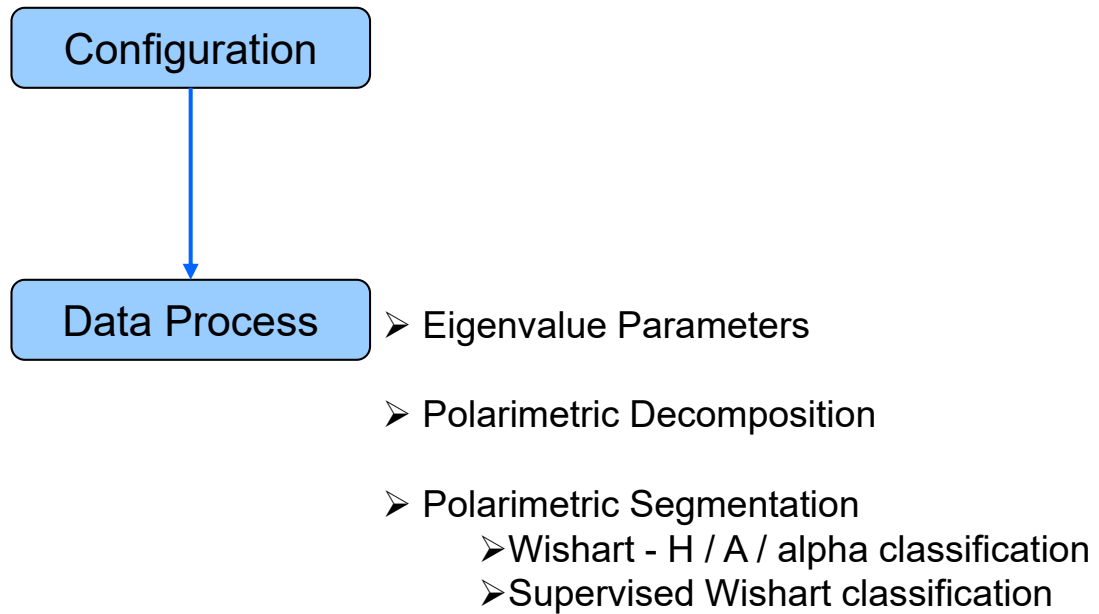
11-12 / 05 / 2021

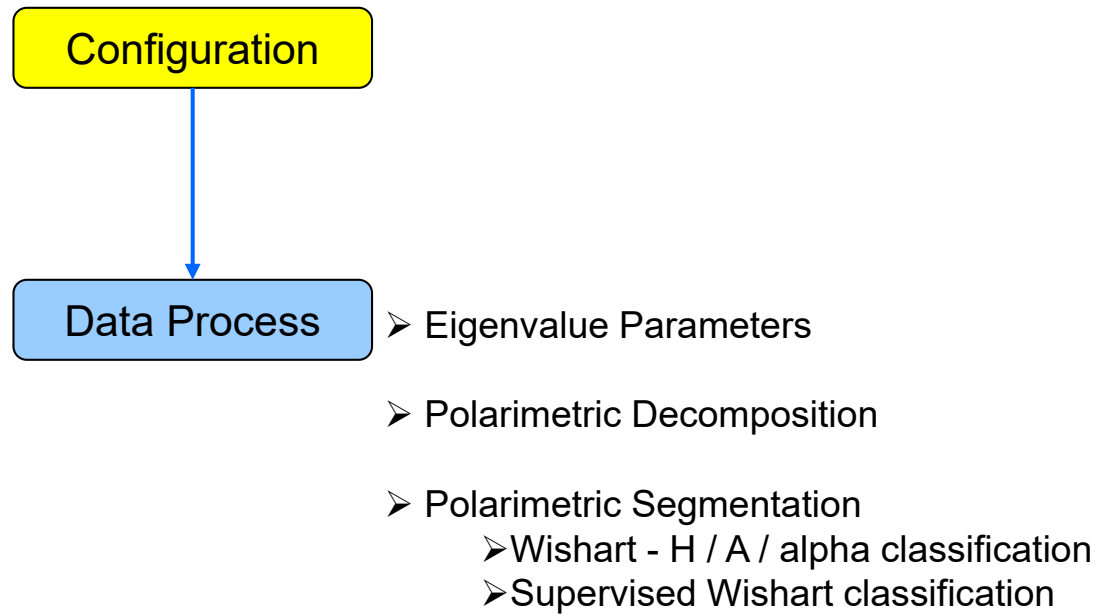


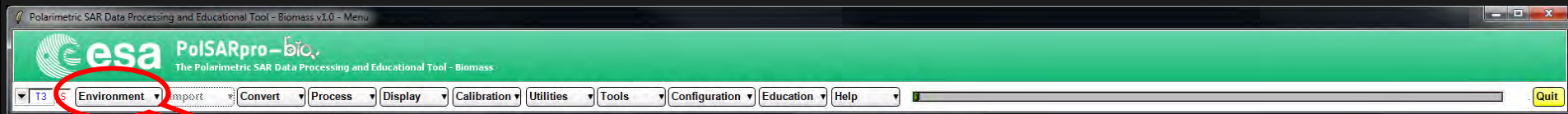
ALOS : Advanced Land Observing Satellite
PALSAR : Phase Array L-Band SAR

DATA SETS

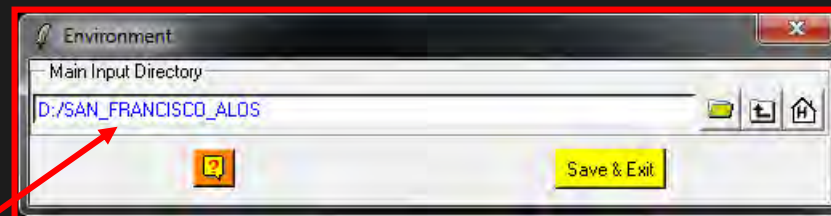








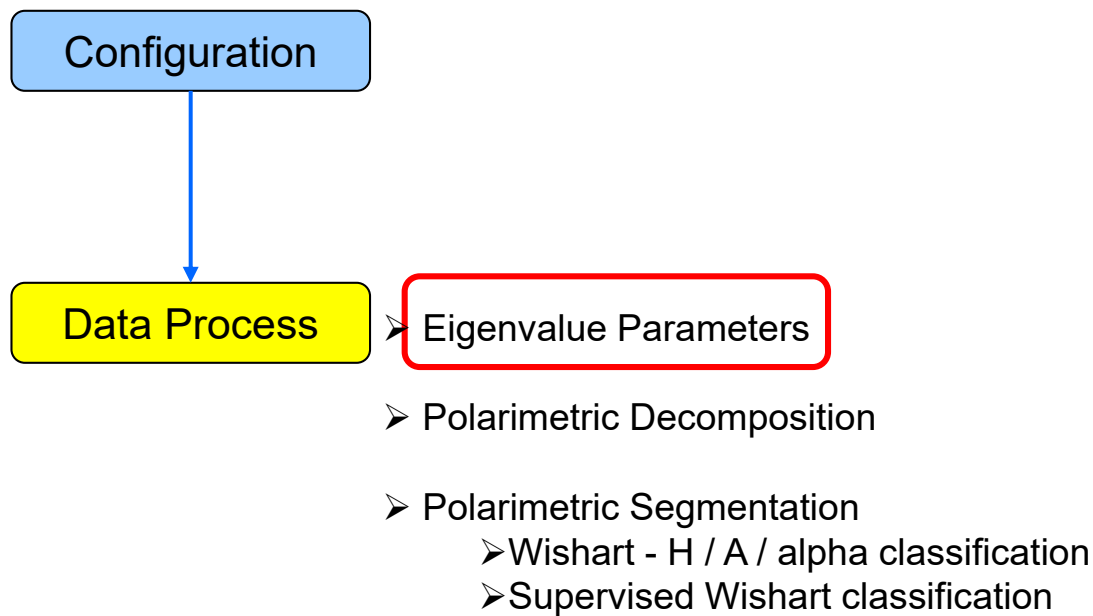
- Single Data Set (Pol-SAR)
- Dual Data Sets (Single Baseline Pol-InSAR)
- Multi Data Sets (Time series / Pol-TomSAR)

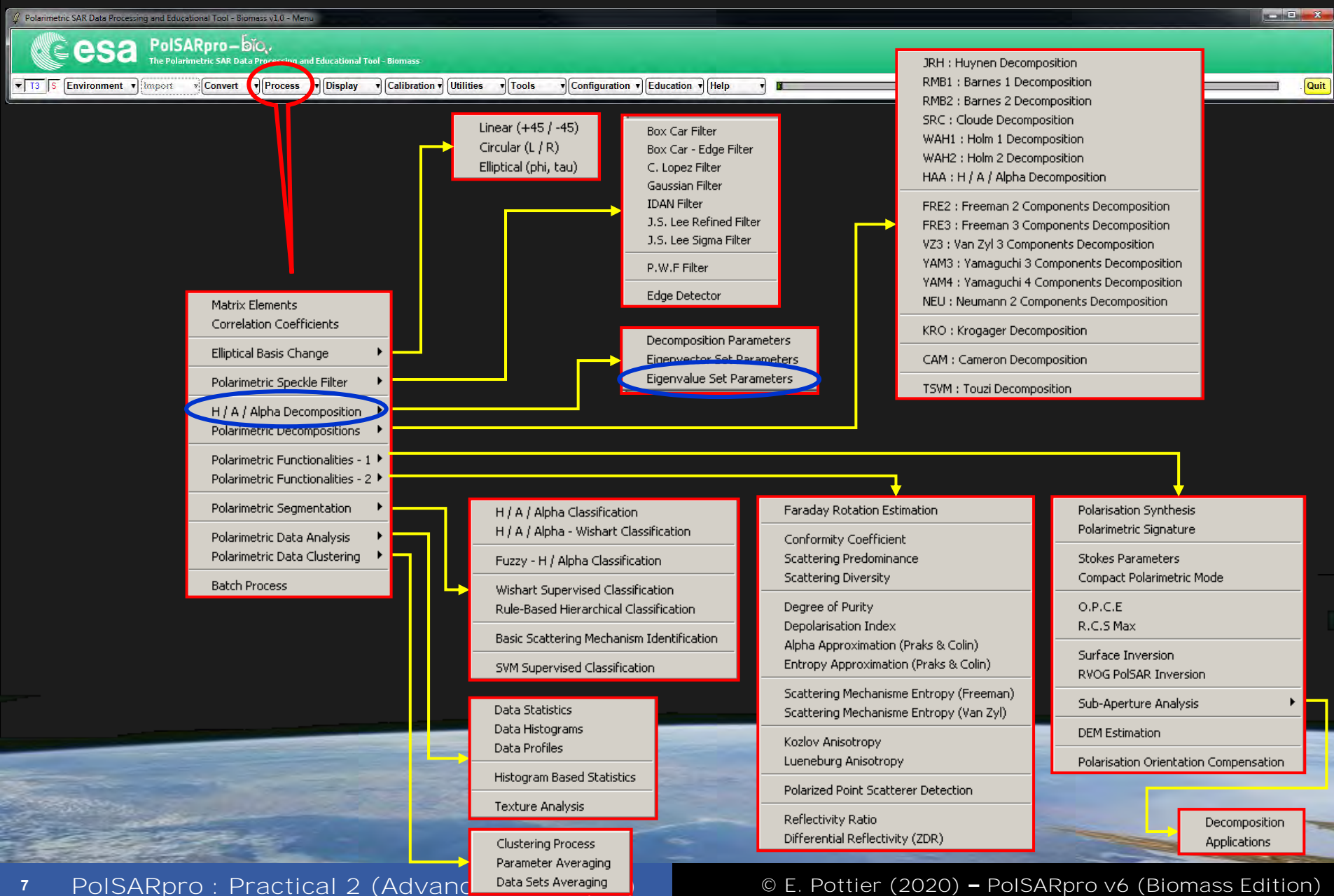


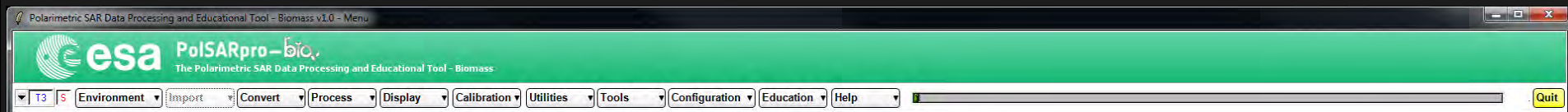
Configure Data Main Directory location

Input Data Directory :

C:/ ... / SAN_FRANCISCO_ALOS-1_SNAP



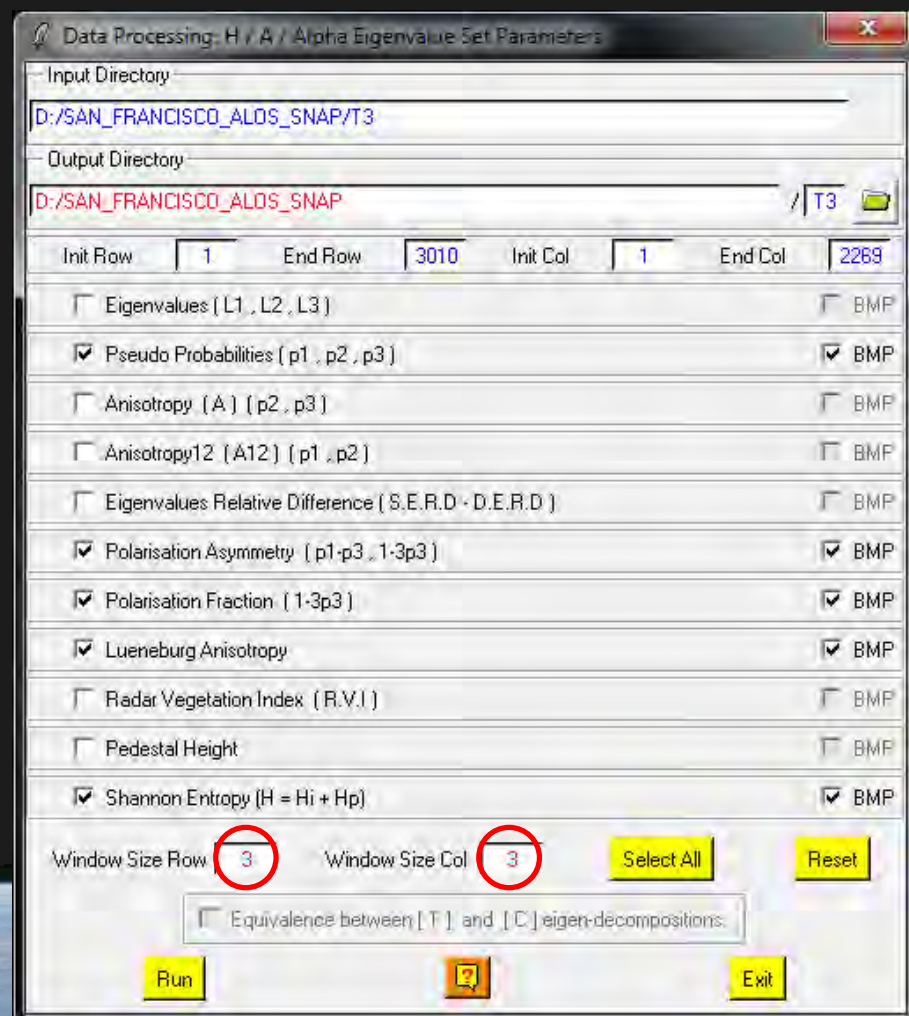




Do it Yourself:

Select some elements, set the parameters and view the corresponding BMP files (select BMP).

Window Size = 3

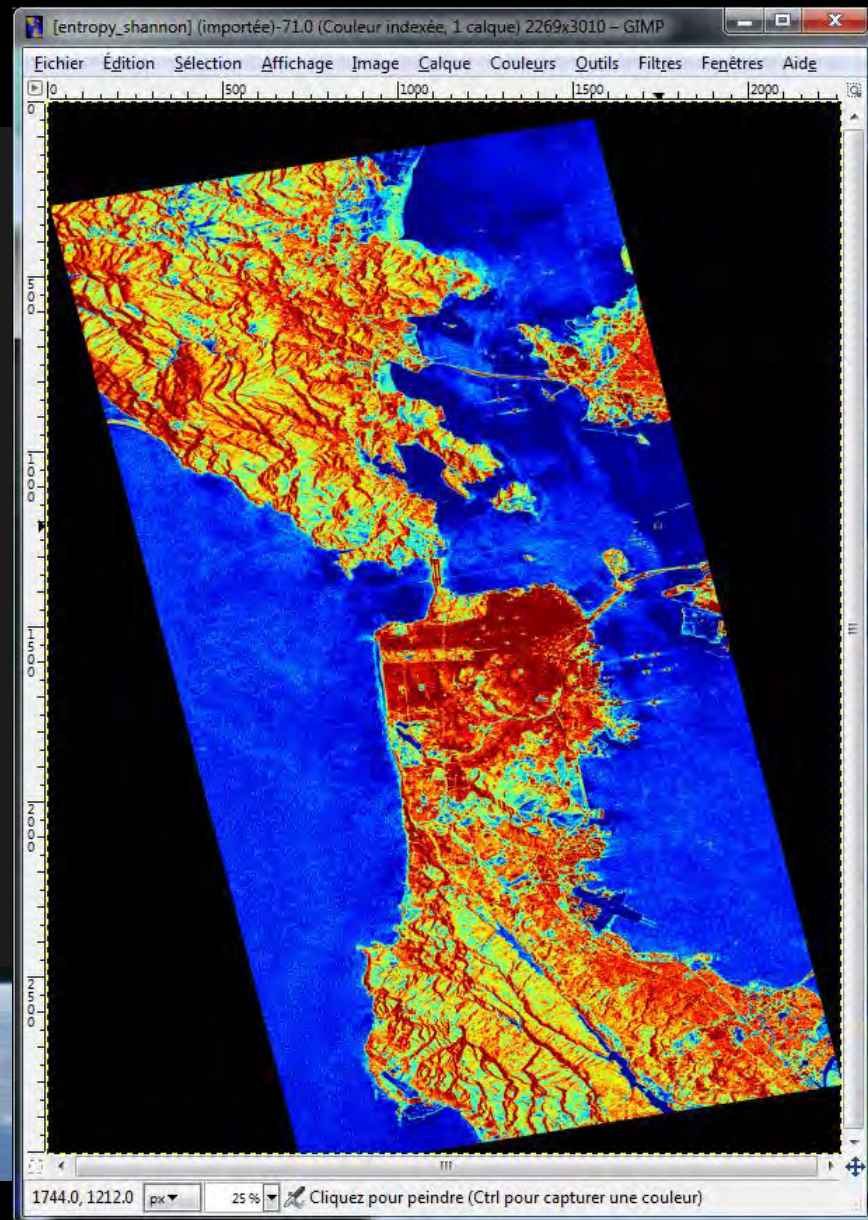


EIGENVALUE SET PARAMETERS

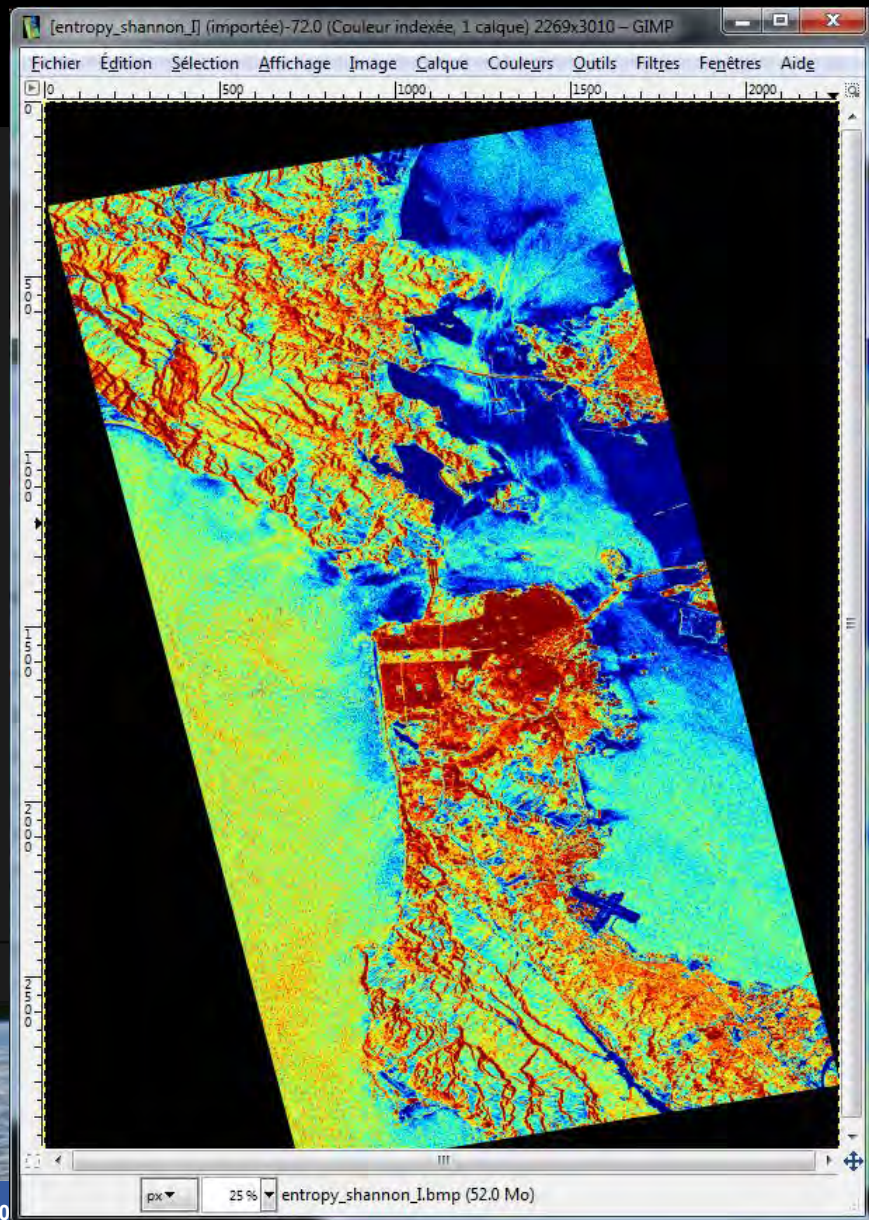
Pauli RGB



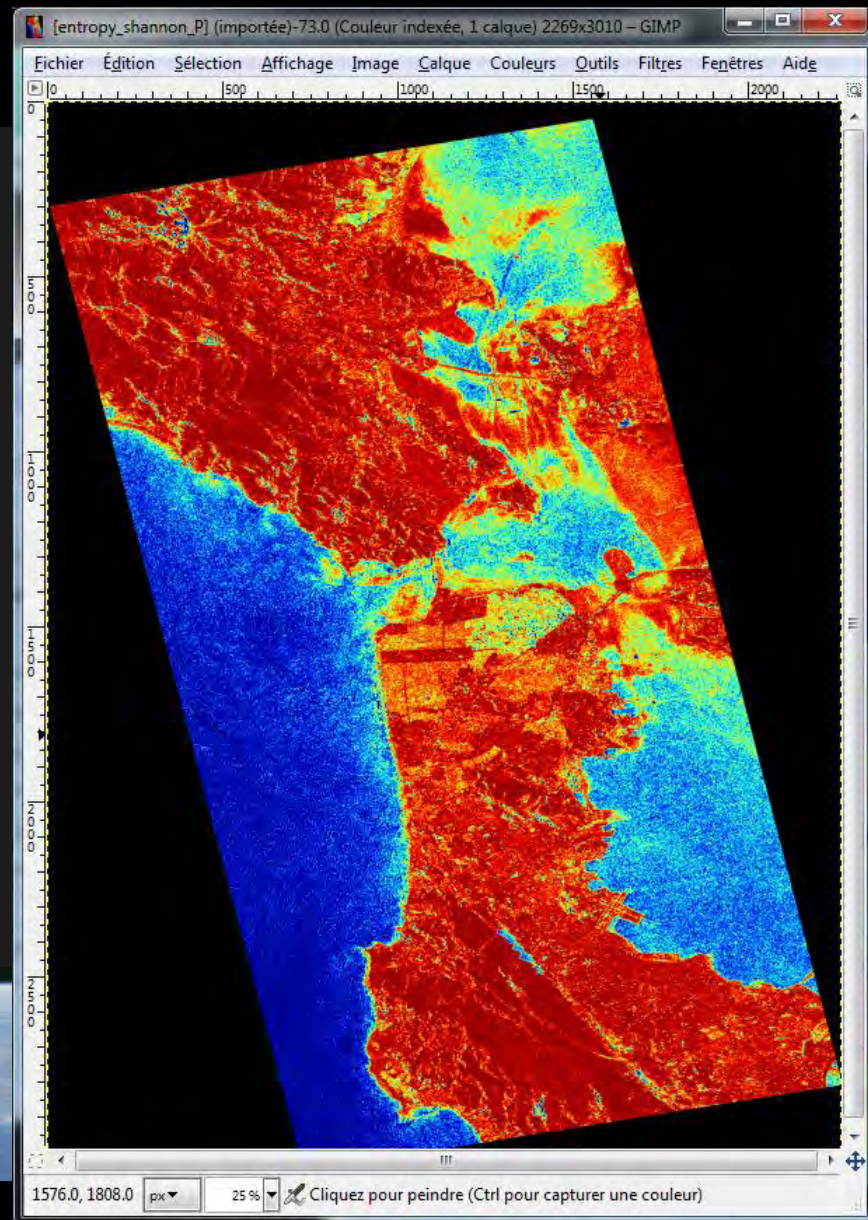
Entropy Shannon



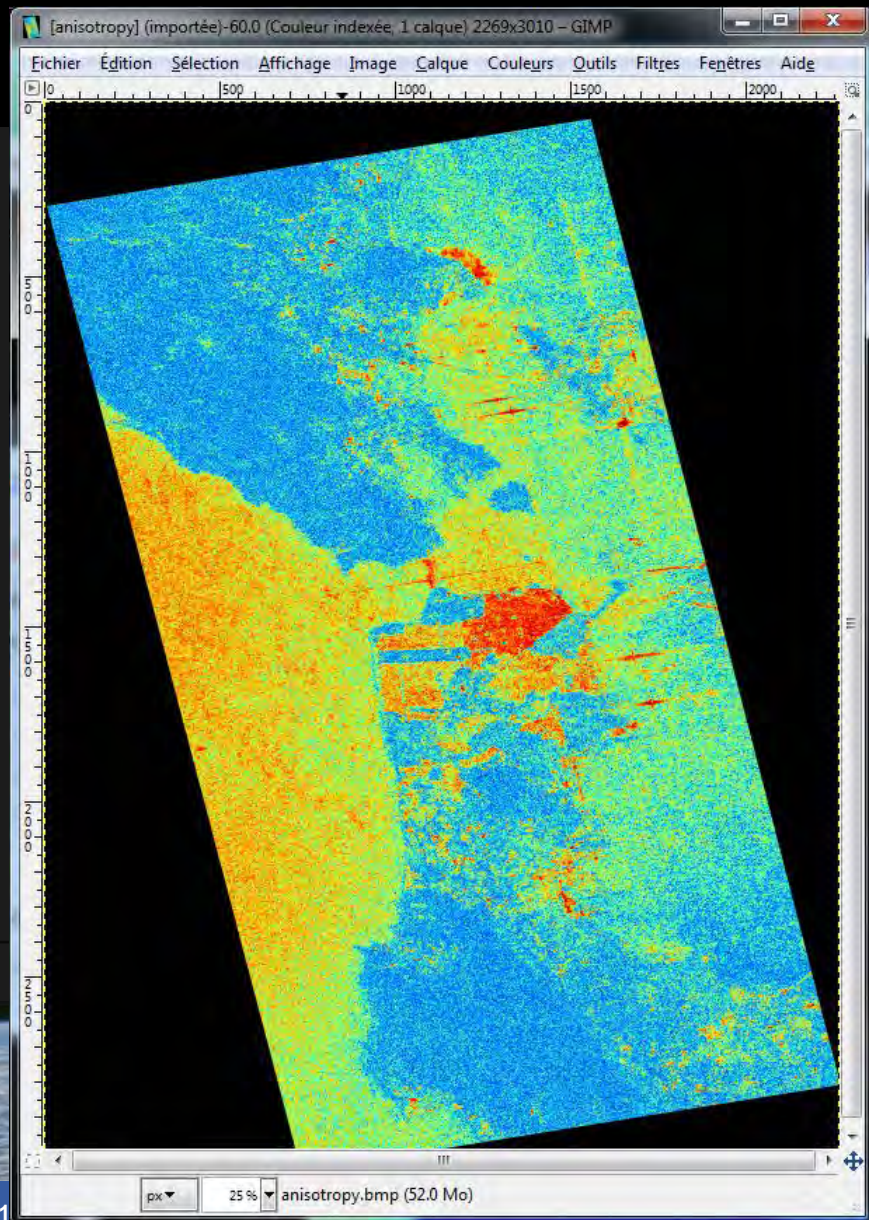
Entropy I



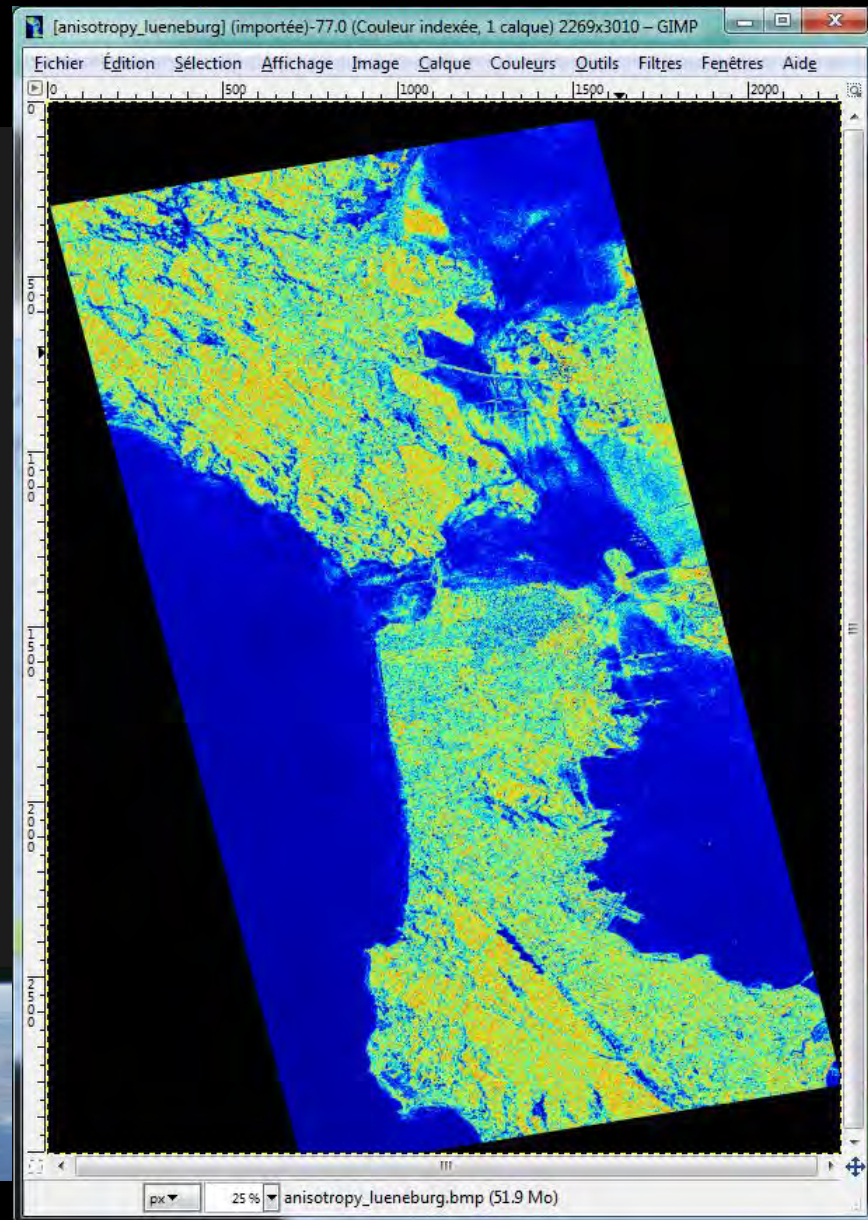
Entropy P

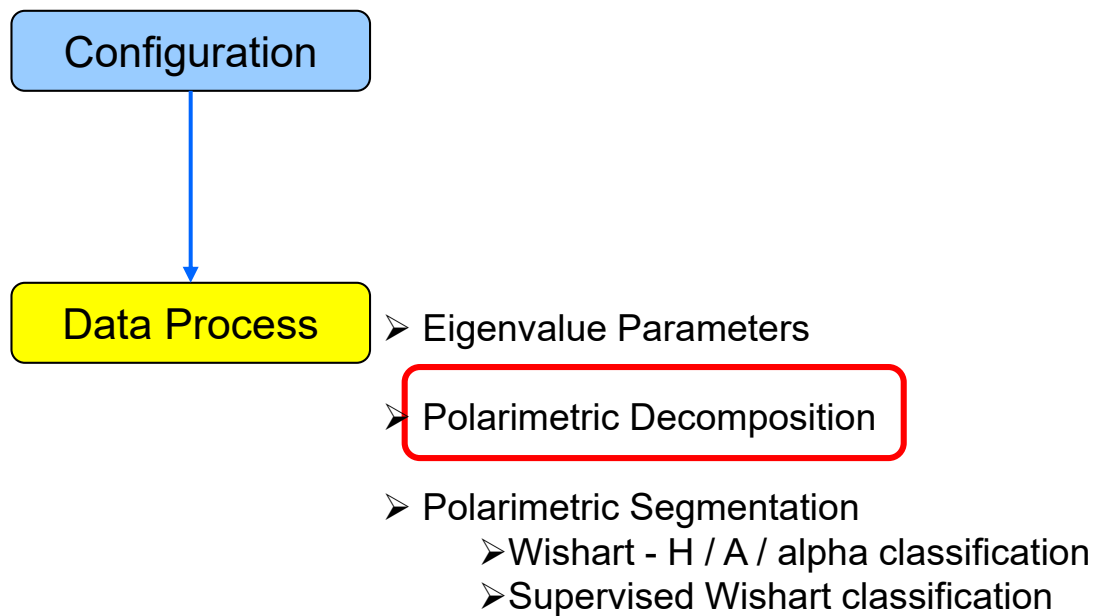


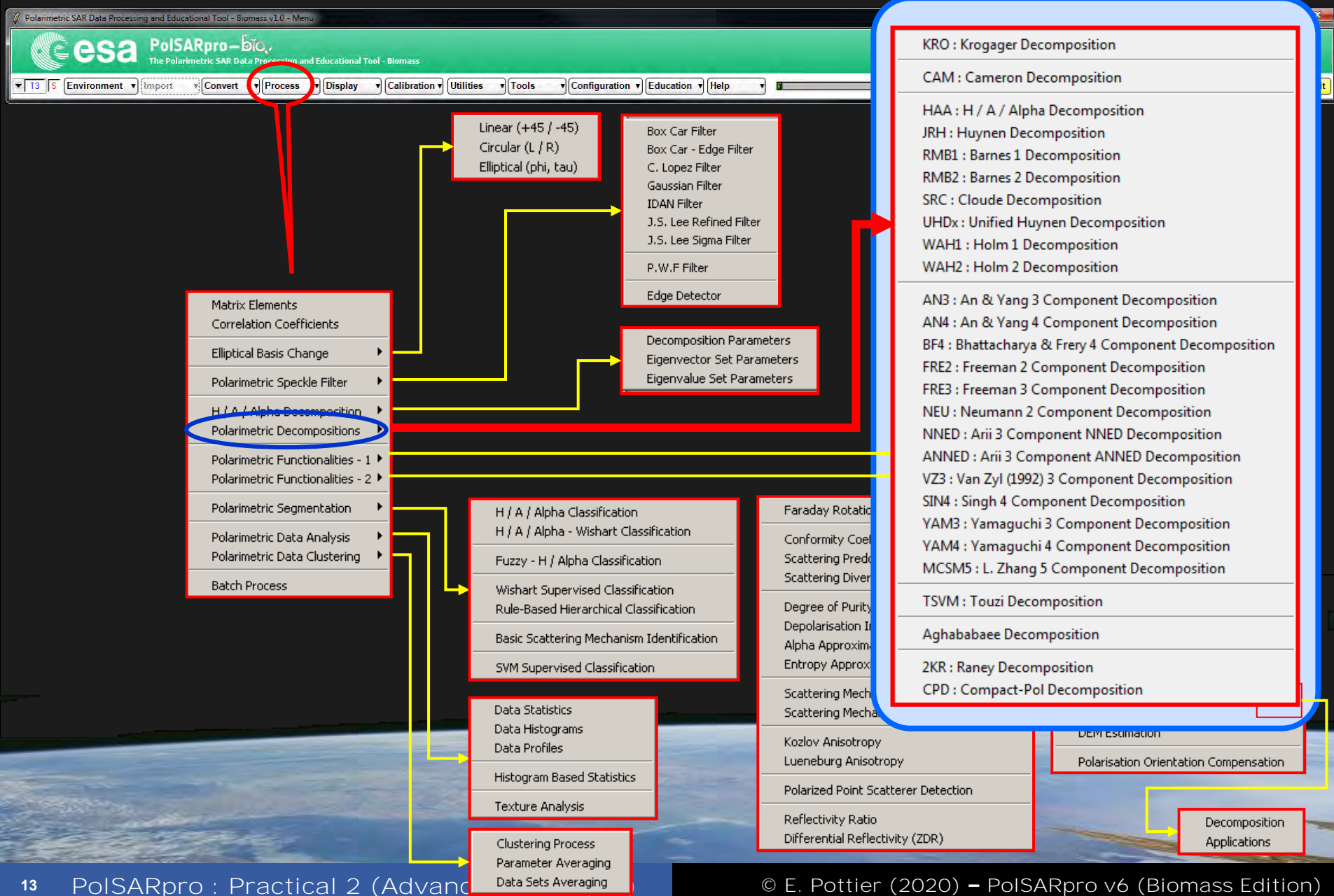
Anisotropy

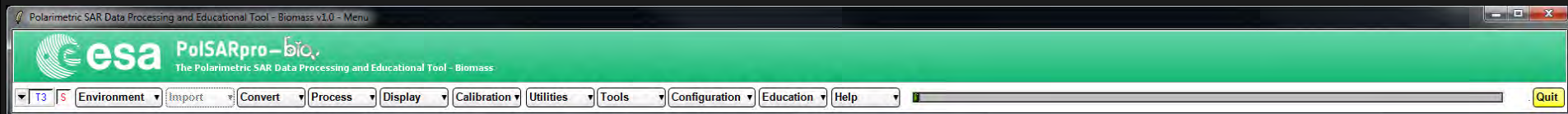


Lueneburg Anisotropy







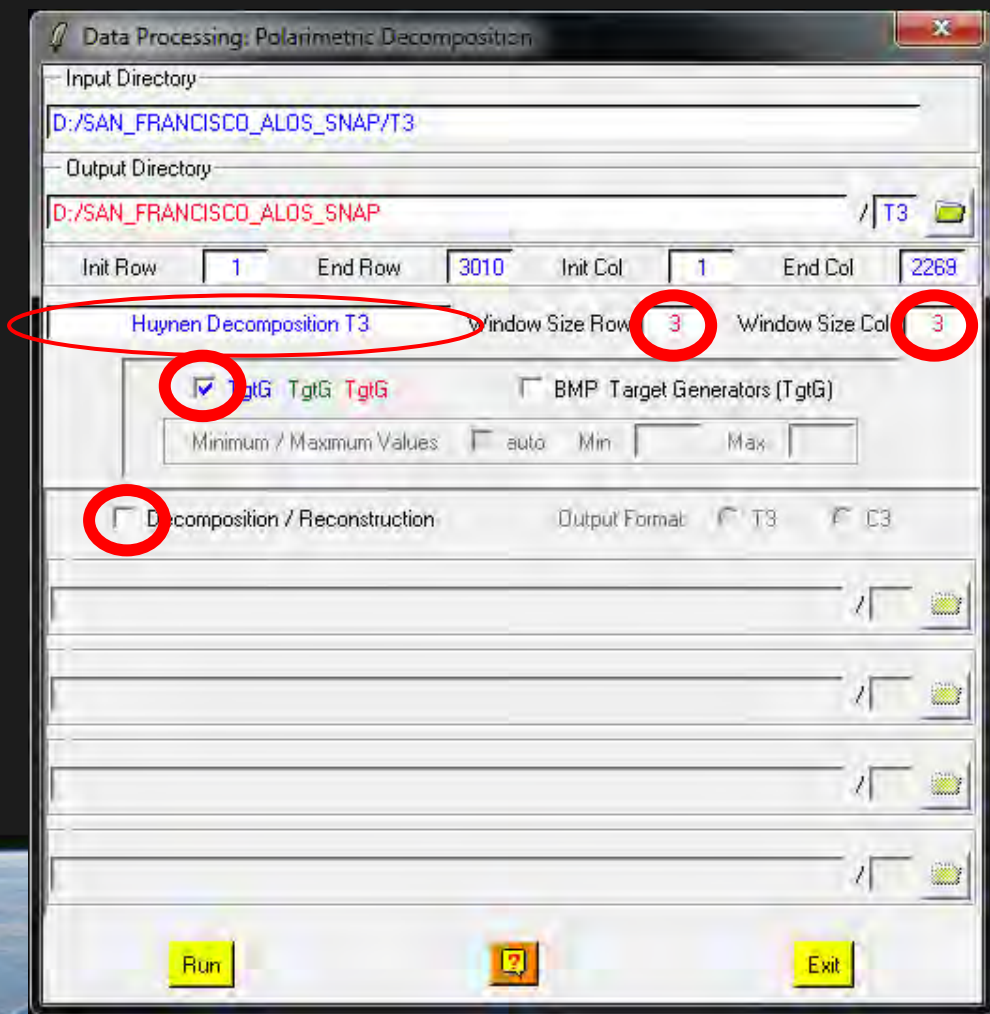


Do it Yourself:

Select a decomposition,
Select the pauli RGB generation.

Don't select Decomposition /
Reconstruction

Window Size = 3

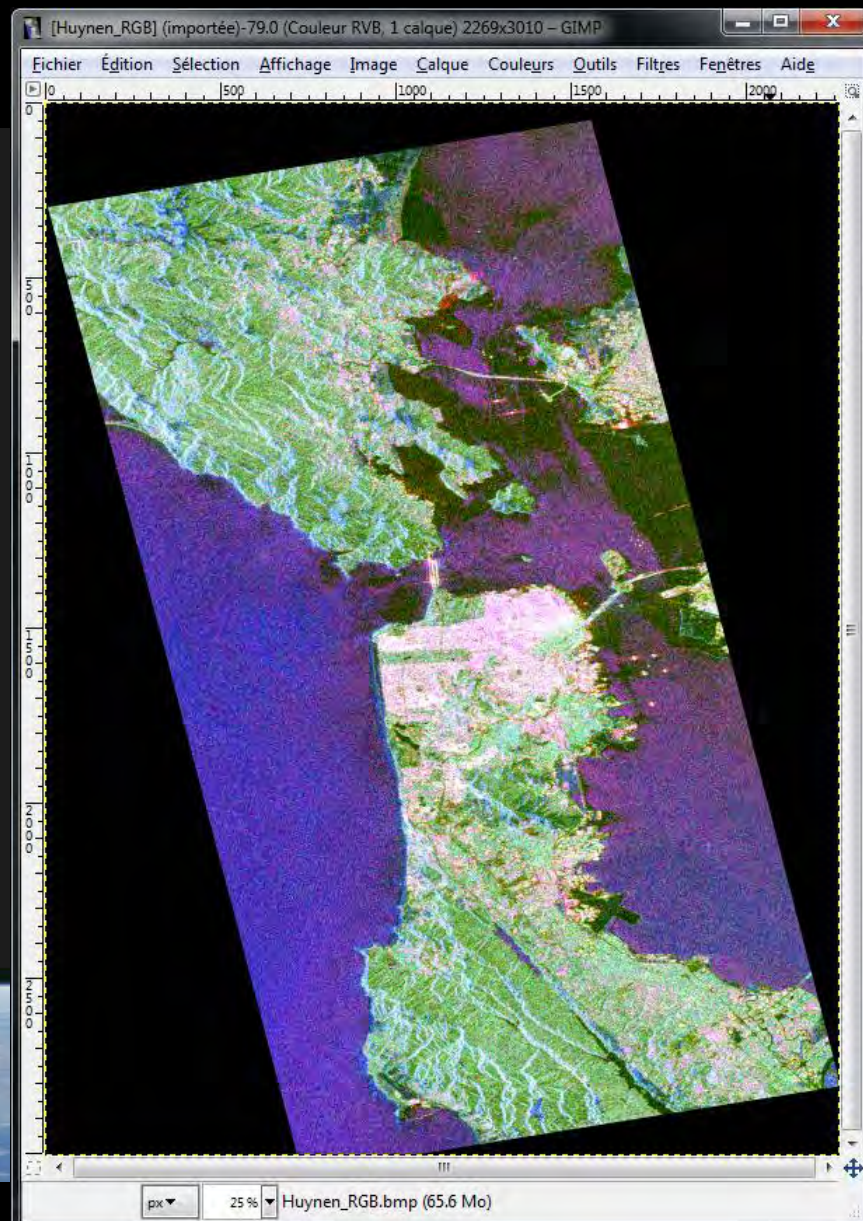


POLARIMETRIC DECOMPOSITION

Pauli RGB



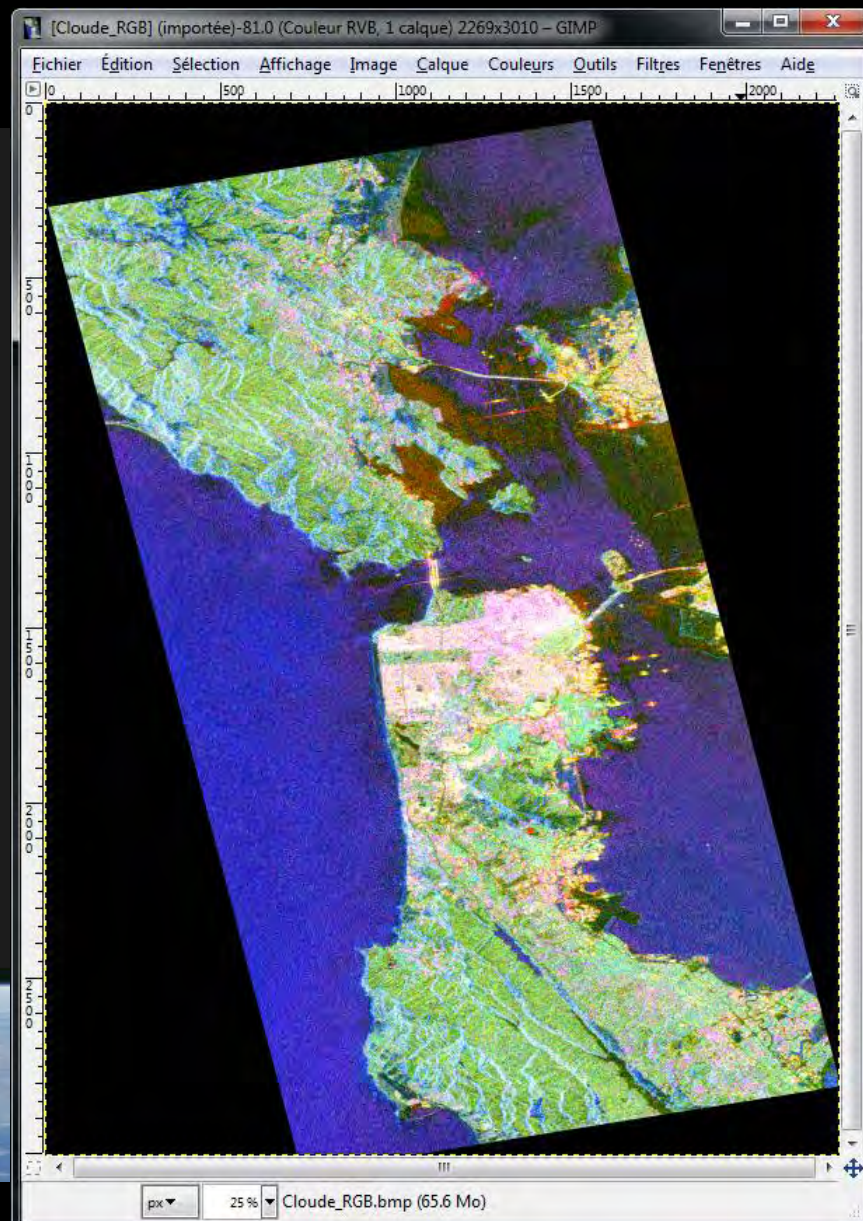
Pauli Huynen



Pauli RGB



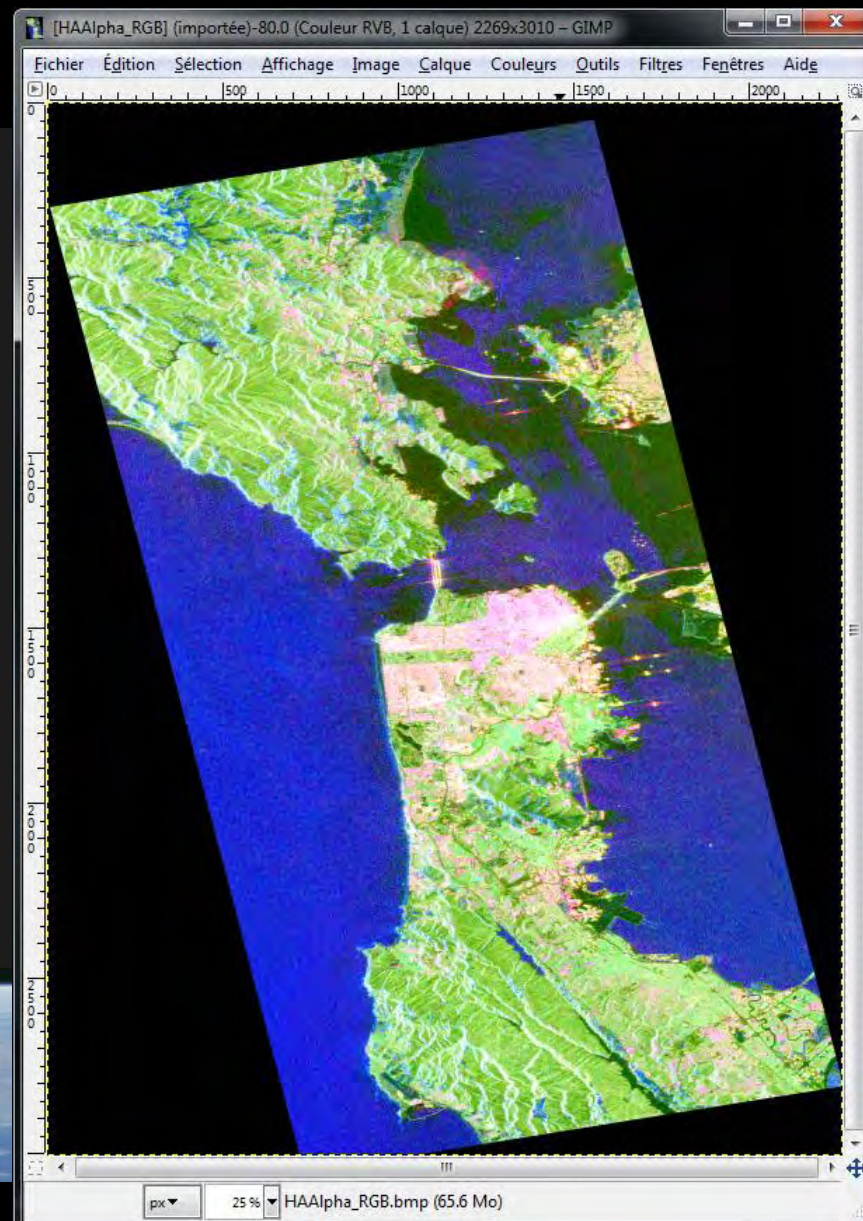
Pauli Cloude



Pauli RGB



Pauli H-A-Alpha



Pauli RGB



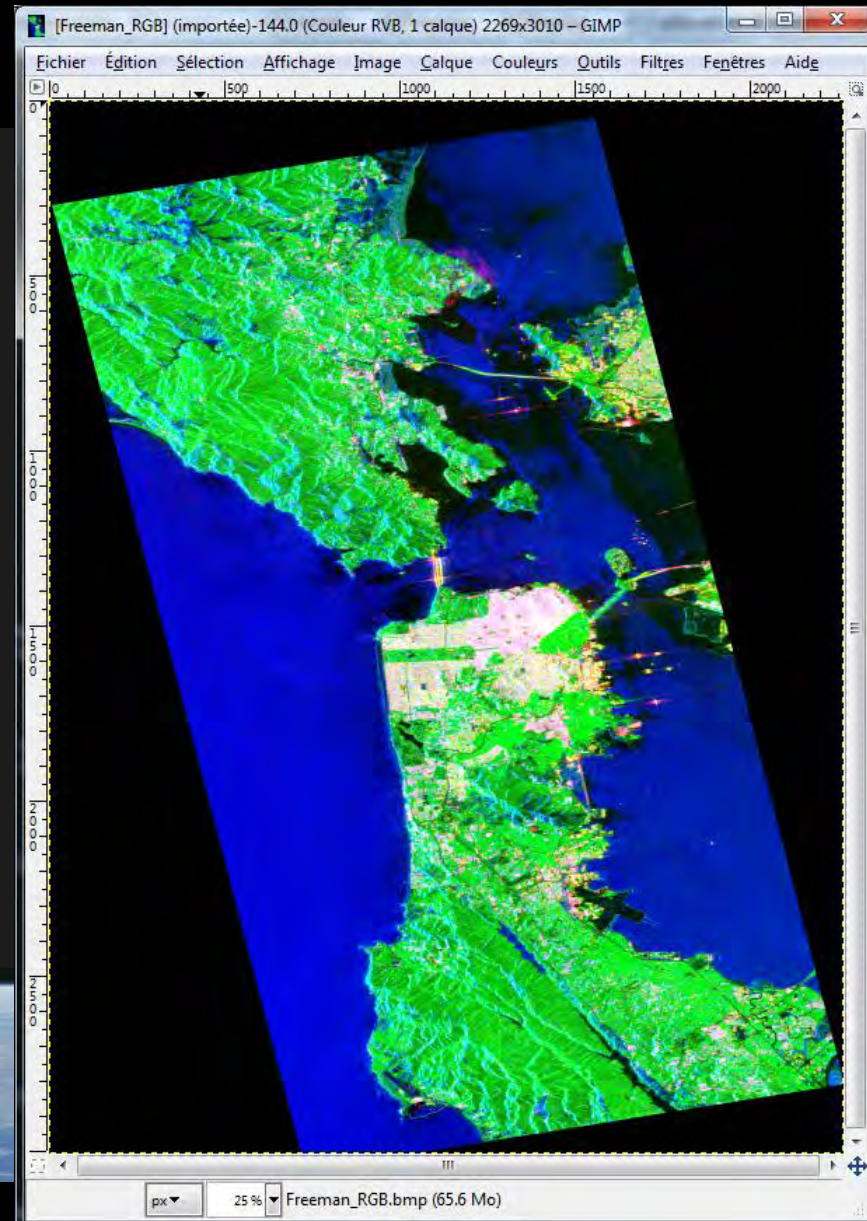
Pauli Van Zyl 3



Pauli RGB



Pauli Freeman 3

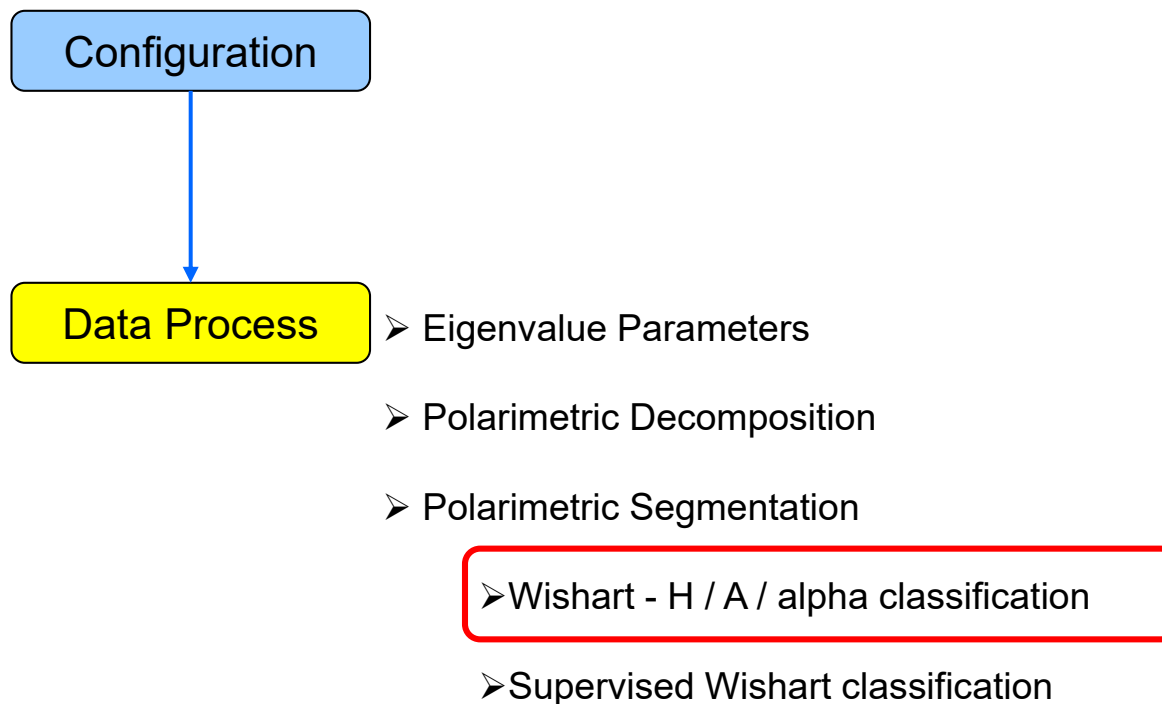


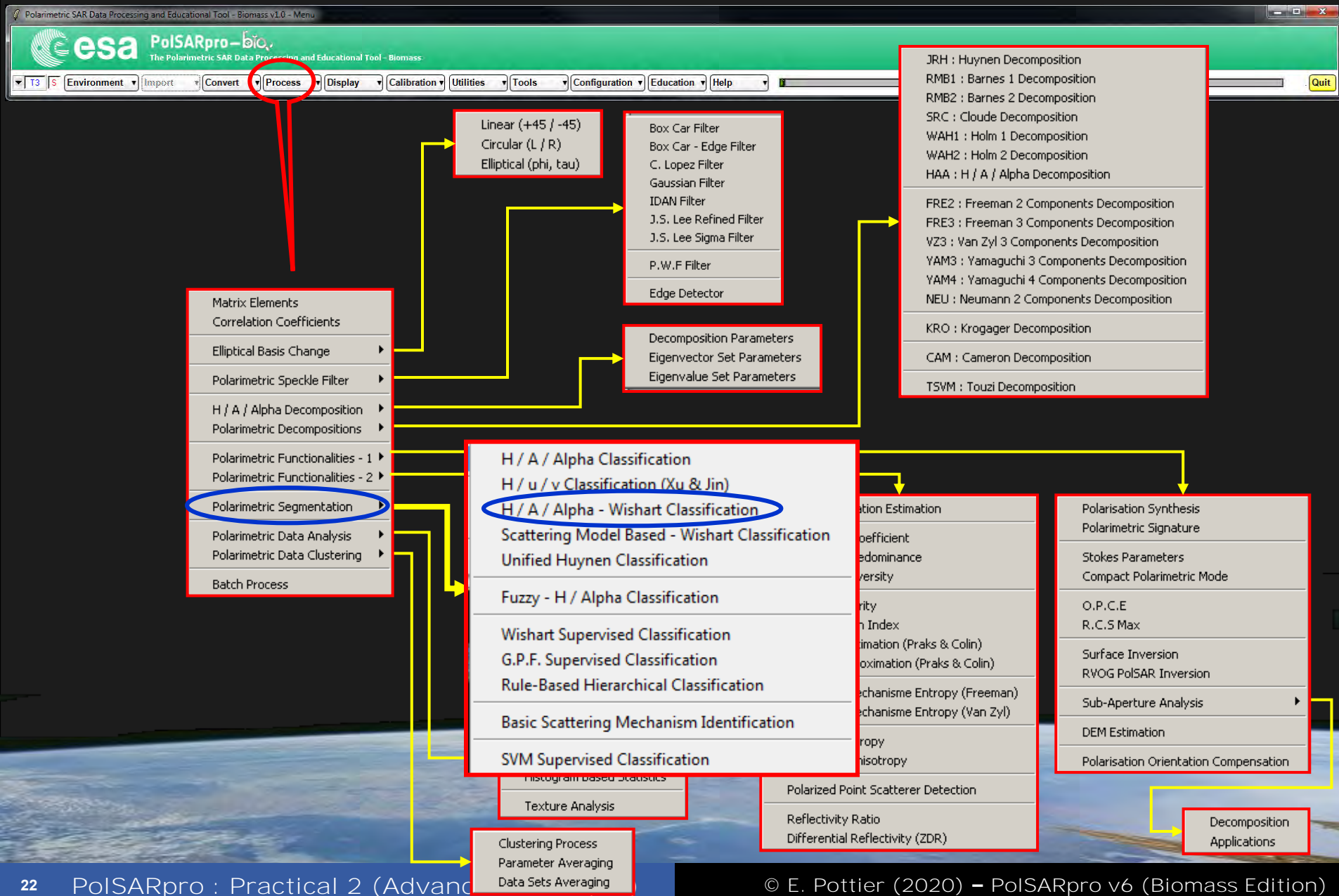
Pauli RGB

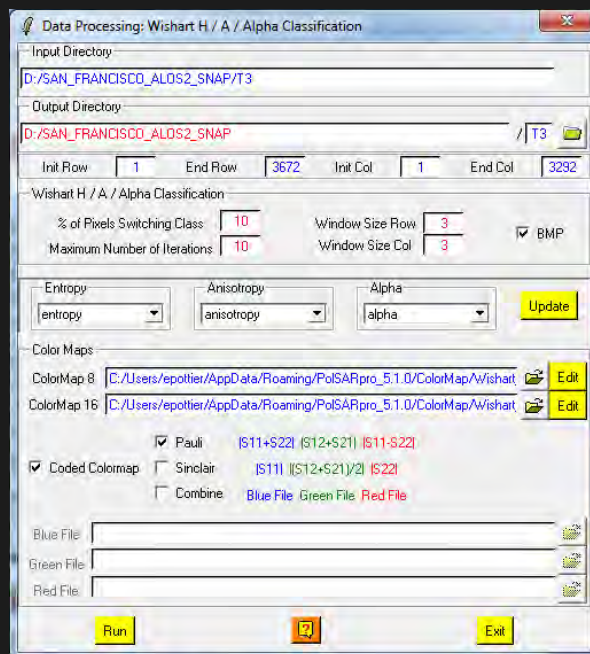
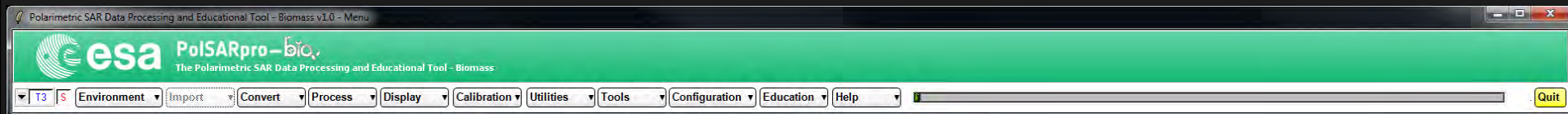


Pauli Yamaguchi 3









DATADIR

config.txt

[T3x3] Elements

Wishart_H_alpha_class_X.bin
Wishart_H_A_alpha_class_X.bin

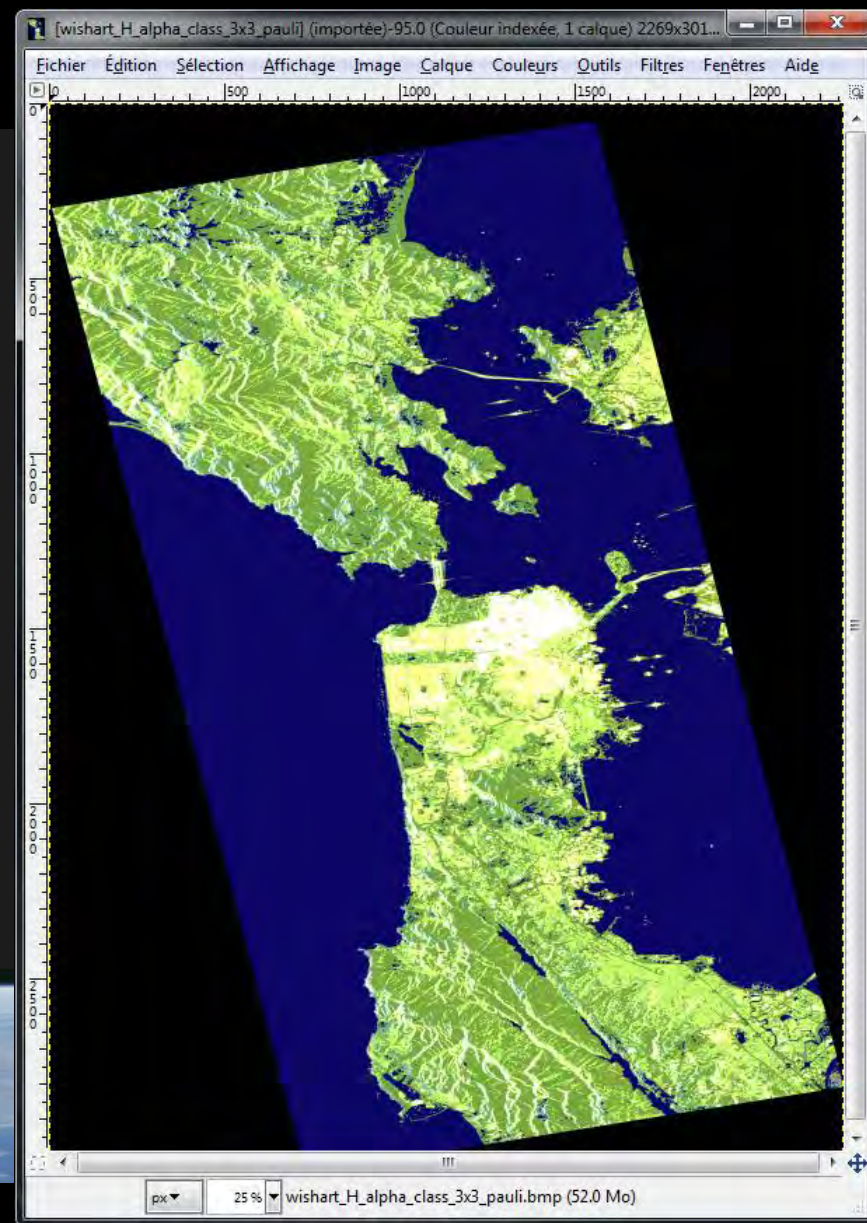
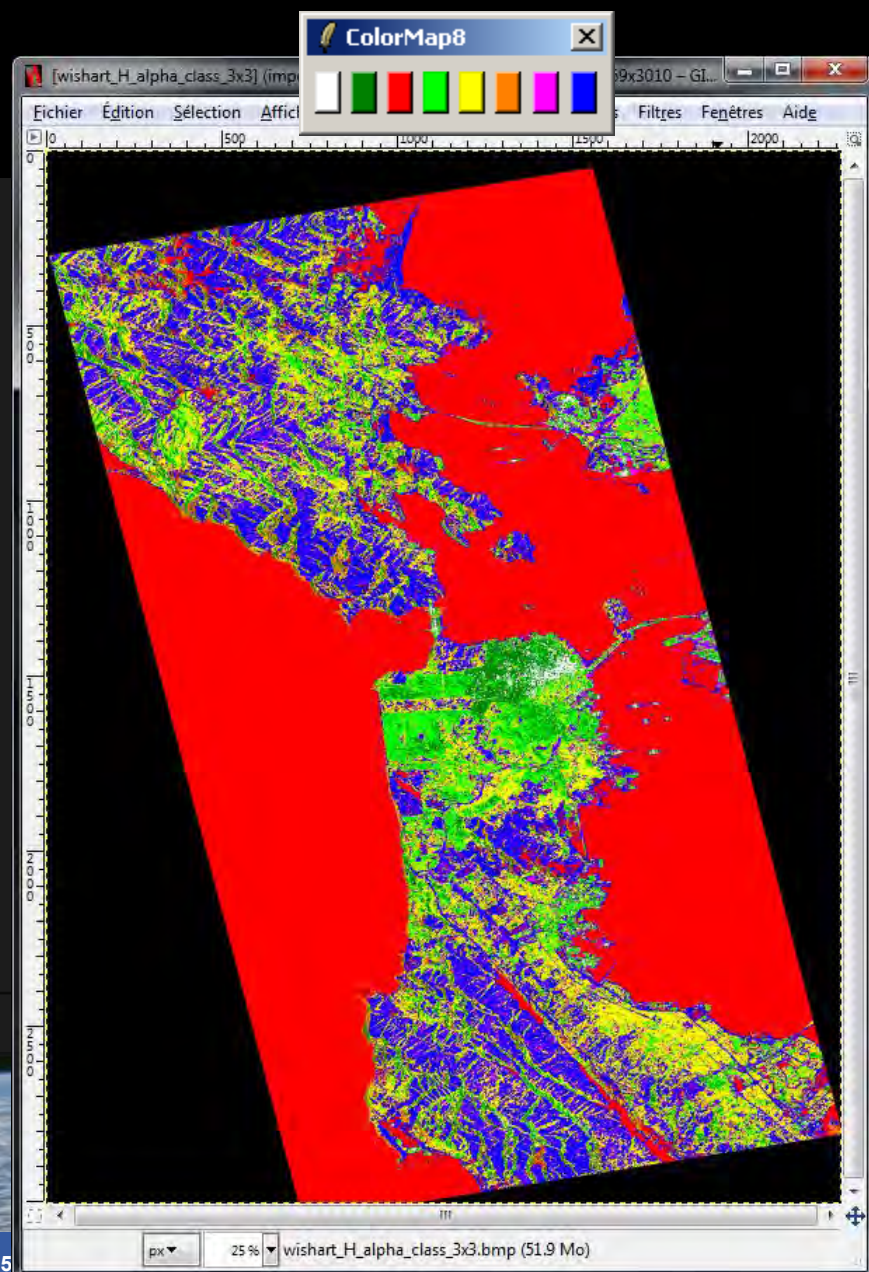
Wishart_H_alpha_class_X.bmp
Wishart_H_A_alpha_class_X.bmp

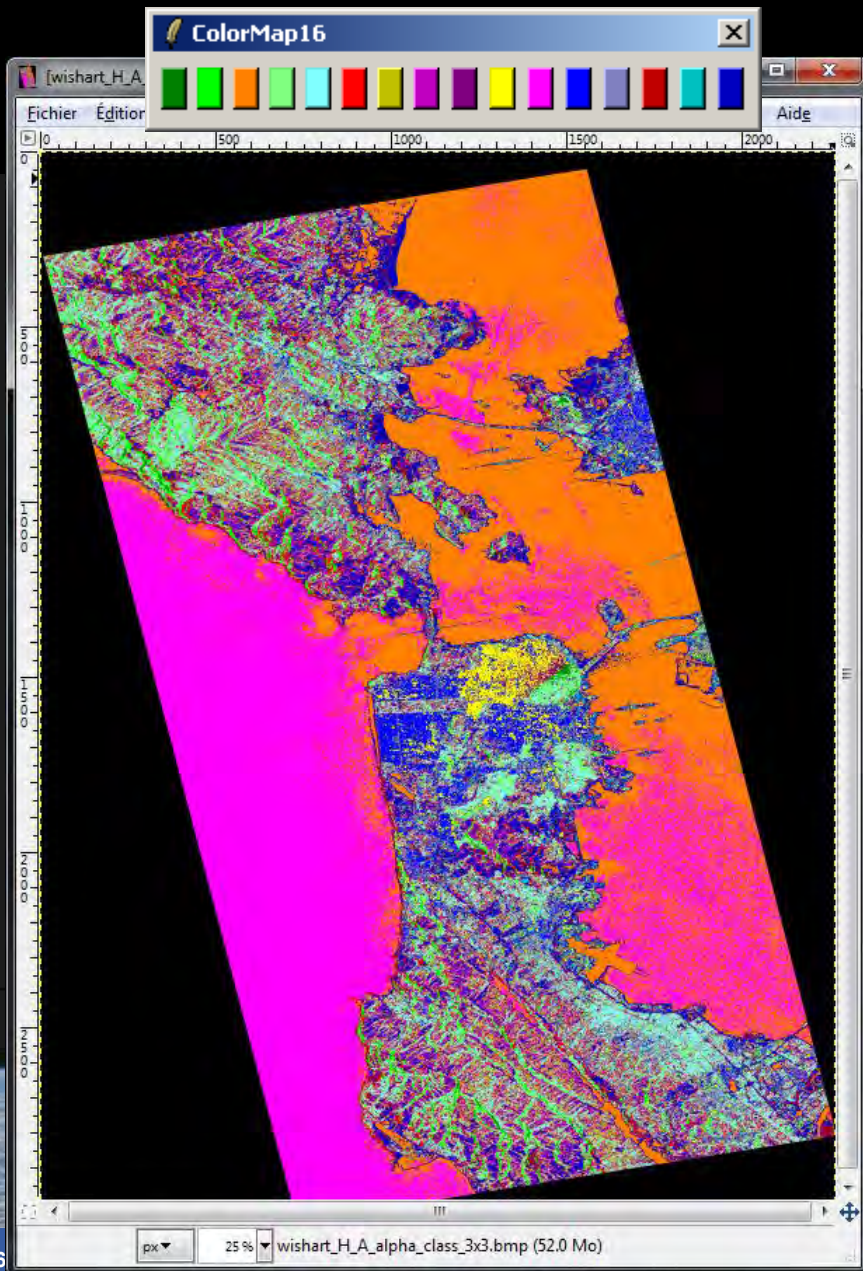
X = window size

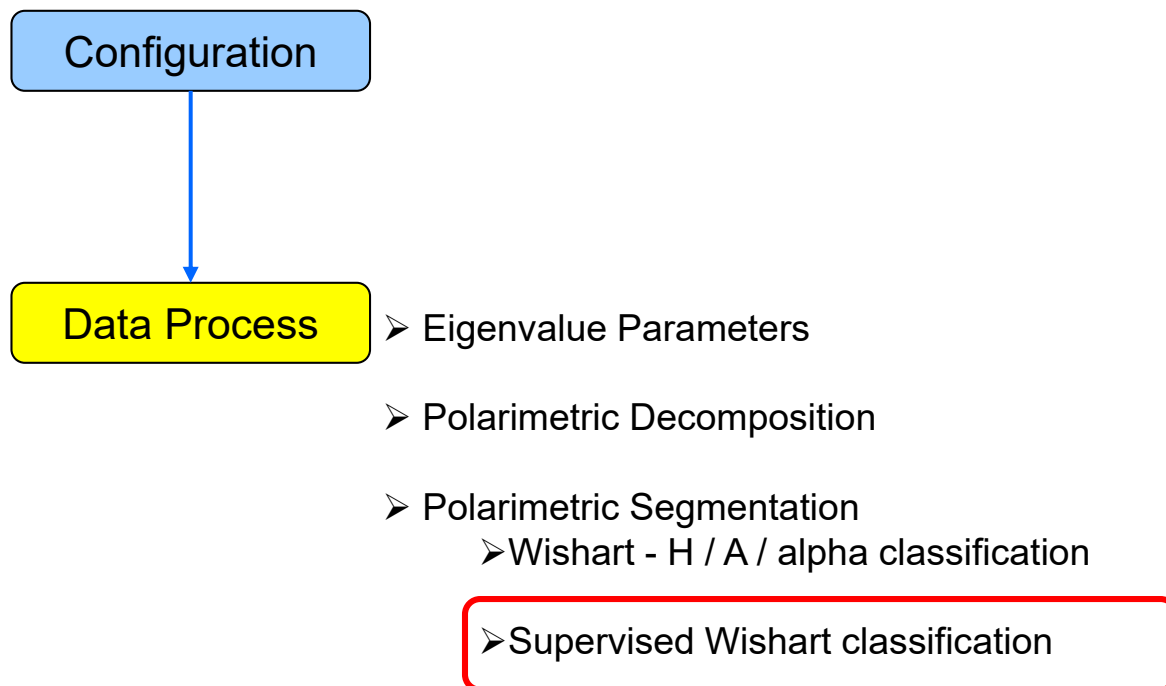
Do it Yourself:

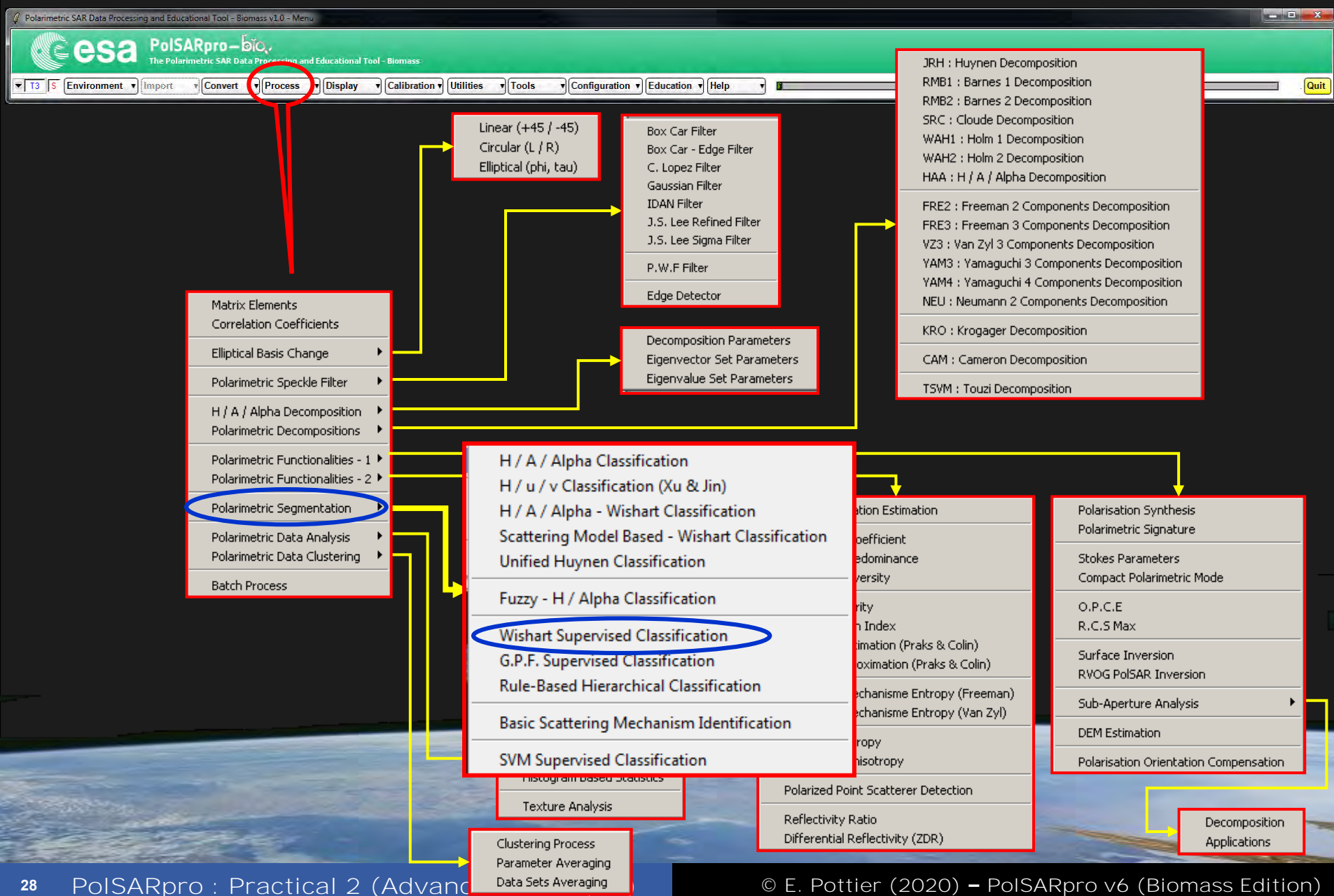
Set the parameters, run and view
the corresponding BMP files.

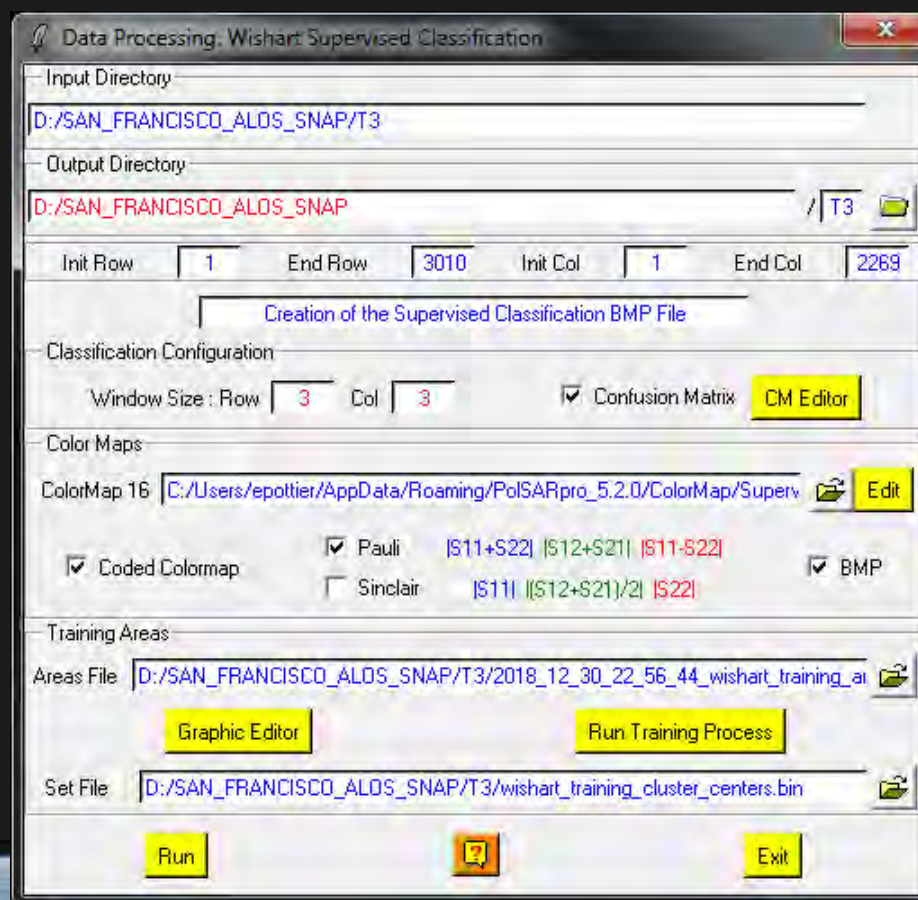
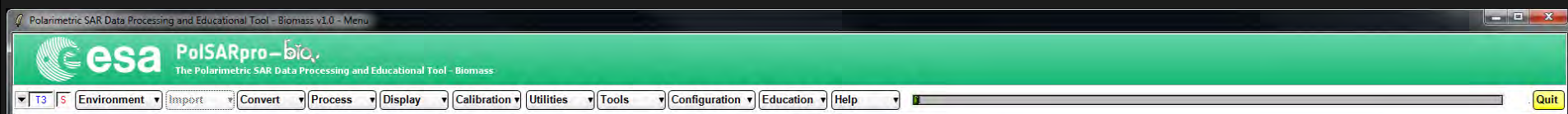
WISHART - H/A/alpha CLASSIFICATION



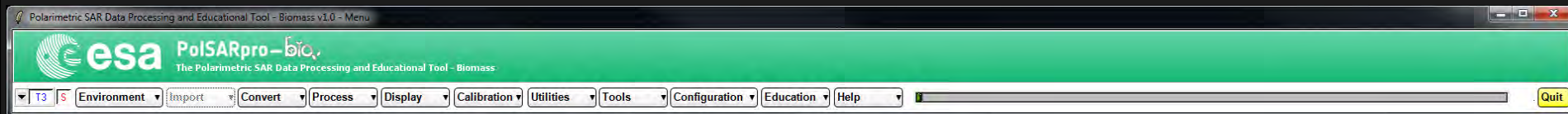








SUPERVISED CLASSIFICATION



Step 1 :

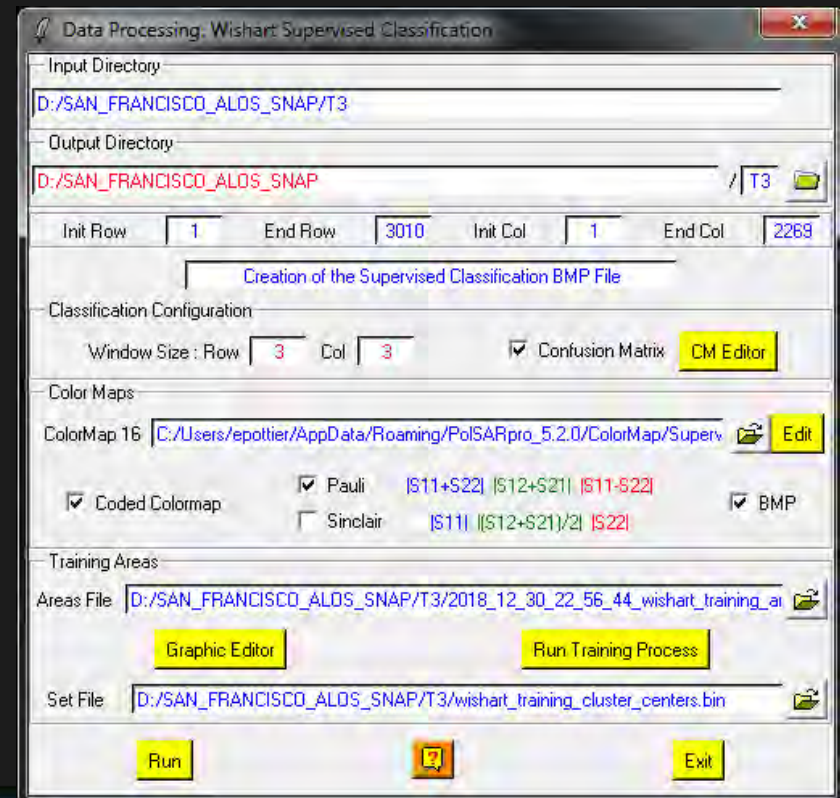
Open **Graphic Editor** to define graphically the Areas of Interest (**Aoi**) or upload an existing Training Areas text file

Step 2 :

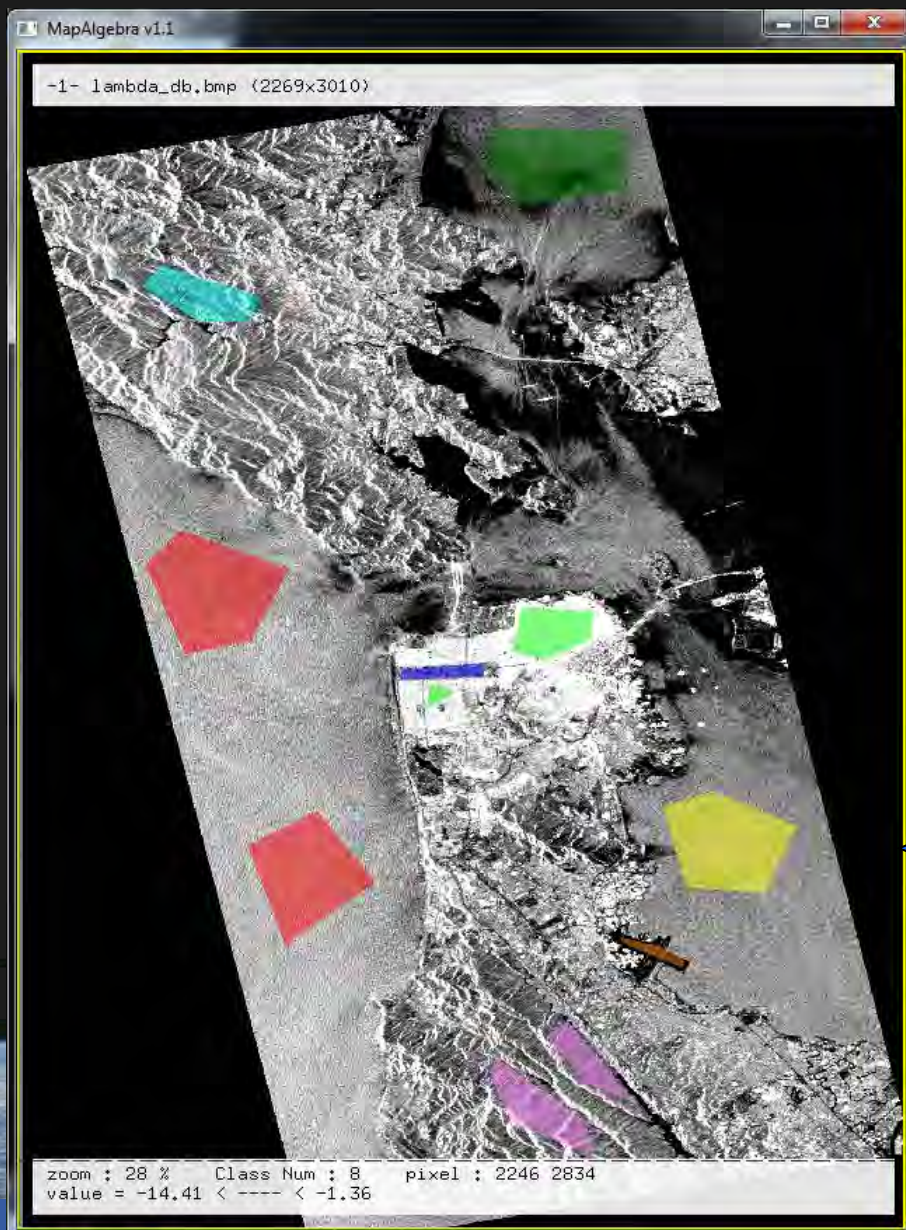
Run **Training Process**. This program will define the training clusters centres from the selected Areas of Interest (**Aoi**).

Step 3 :

Run the Wishart Supervised Classification procedure



SUPERVISED CLASSIFICATION



Data Processing: Wishart Supervised Classification

Input Directory:

Output Directory: / T3

Init Row: End Row: Init Col: End Col:

Creation of the Supervised Classification BMP File

Classification Configuration

Window Size : Row Col ☒ Confusion Matrix

Color Maps

ColorMap 16:

☒ Coded Colormap ☒ Pauli ☐ Sinclair

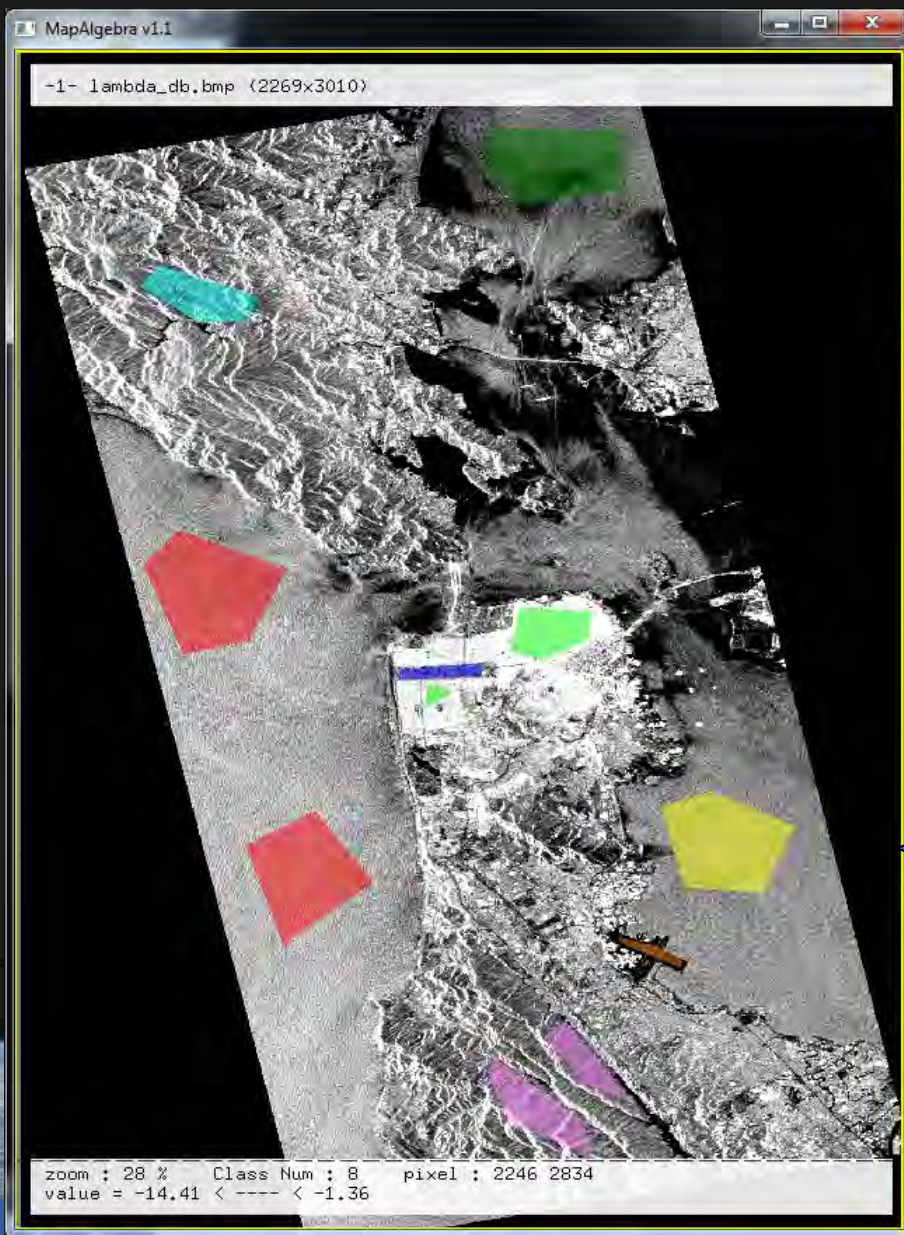
Pauli:
 Sinclair:

☒ BMP

Training Areas

Areas File:

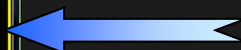
Set File:

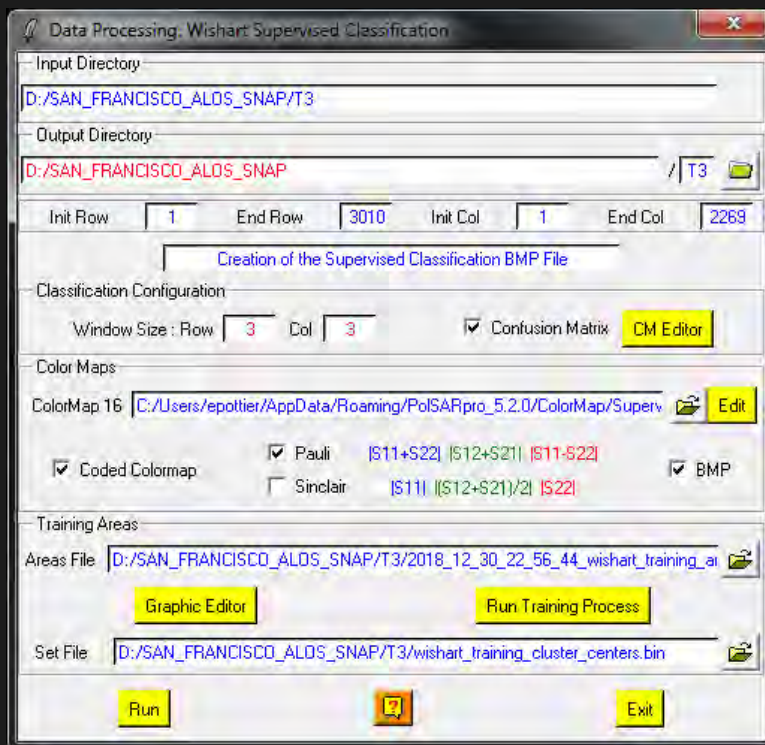
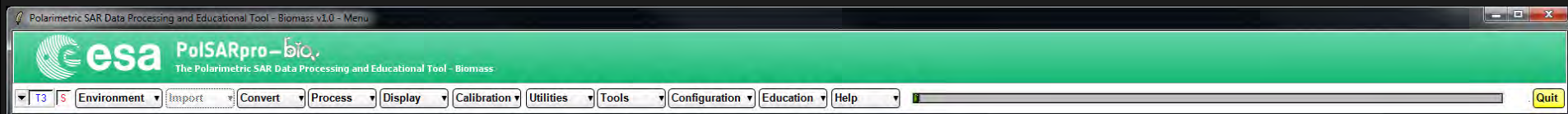


Do it Yourself:

Define the Area Of Interest

- 1) *Right button* : Add a new class
- 2) *Right button* : Select area
- 3) *Left button* : Draw the polygon
- 4) *Enter* : Close the polygon
- 5) Goto step 1 (class) or 2 (area)
- 6) *Right button* : Save configuration





DATADIR

config.txt

[T3x3] Elements

Run Training Process ← Training_areas.txt

Training_areas.bin

Training_cluster_set.bmp

Run Classification

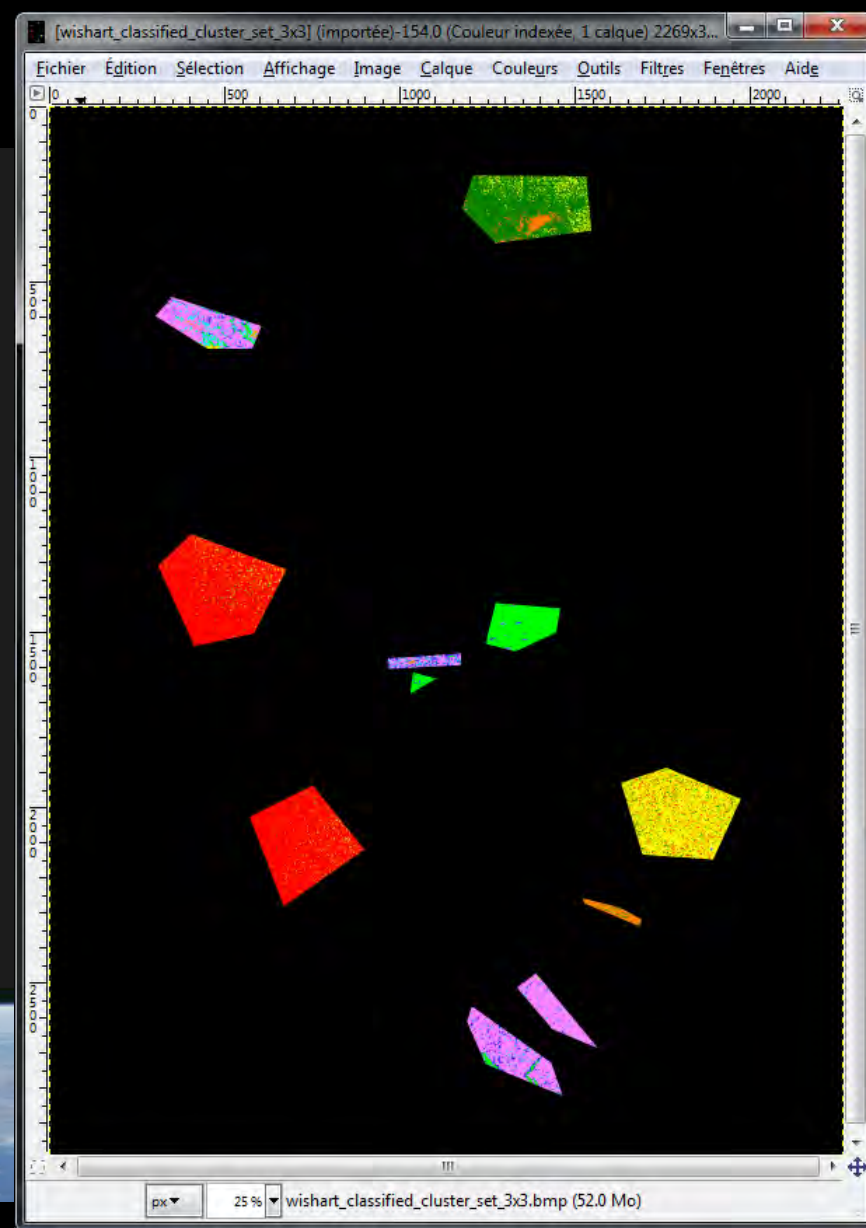
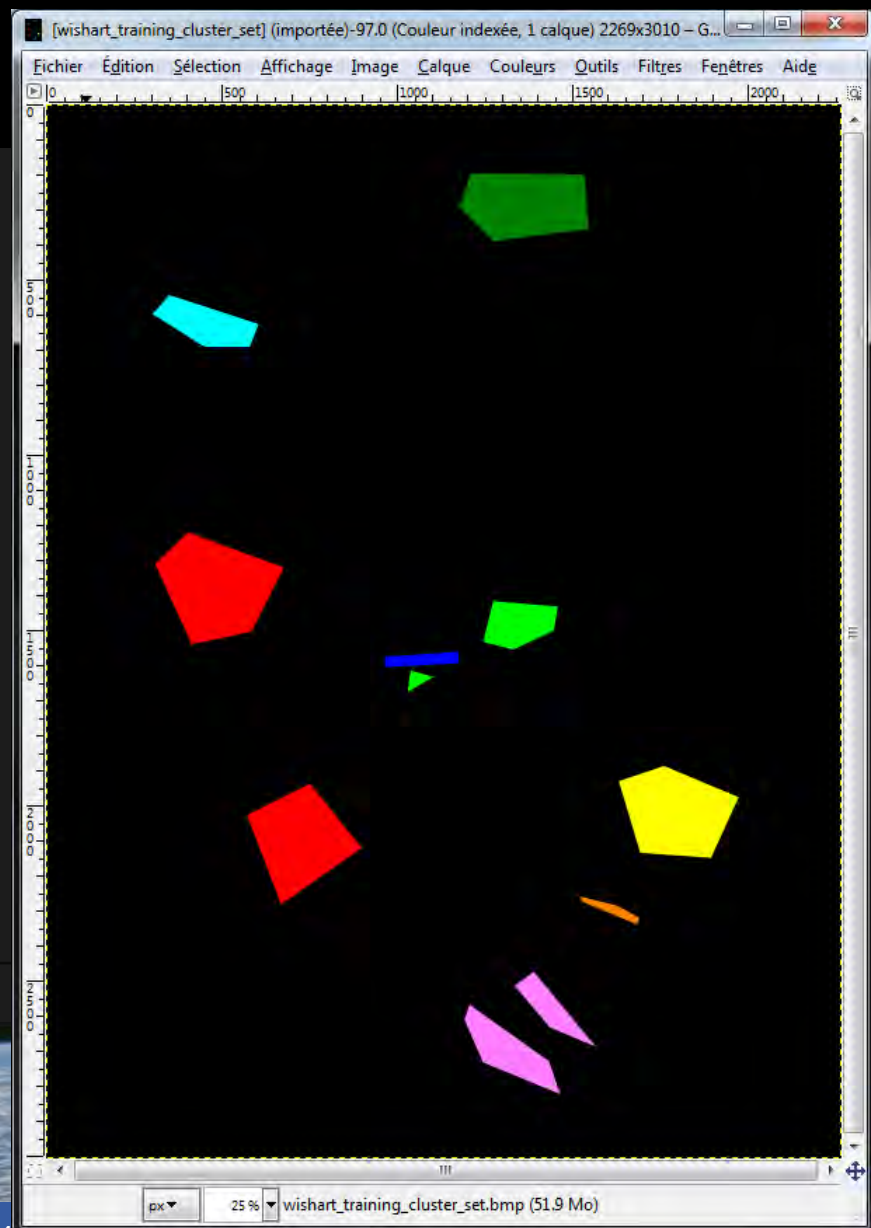
Supervised_class_X.bin
Supervised_class_rej_X.bin
Confusion_matrix_X.txt
Confusion_matrix_rej_X.txt

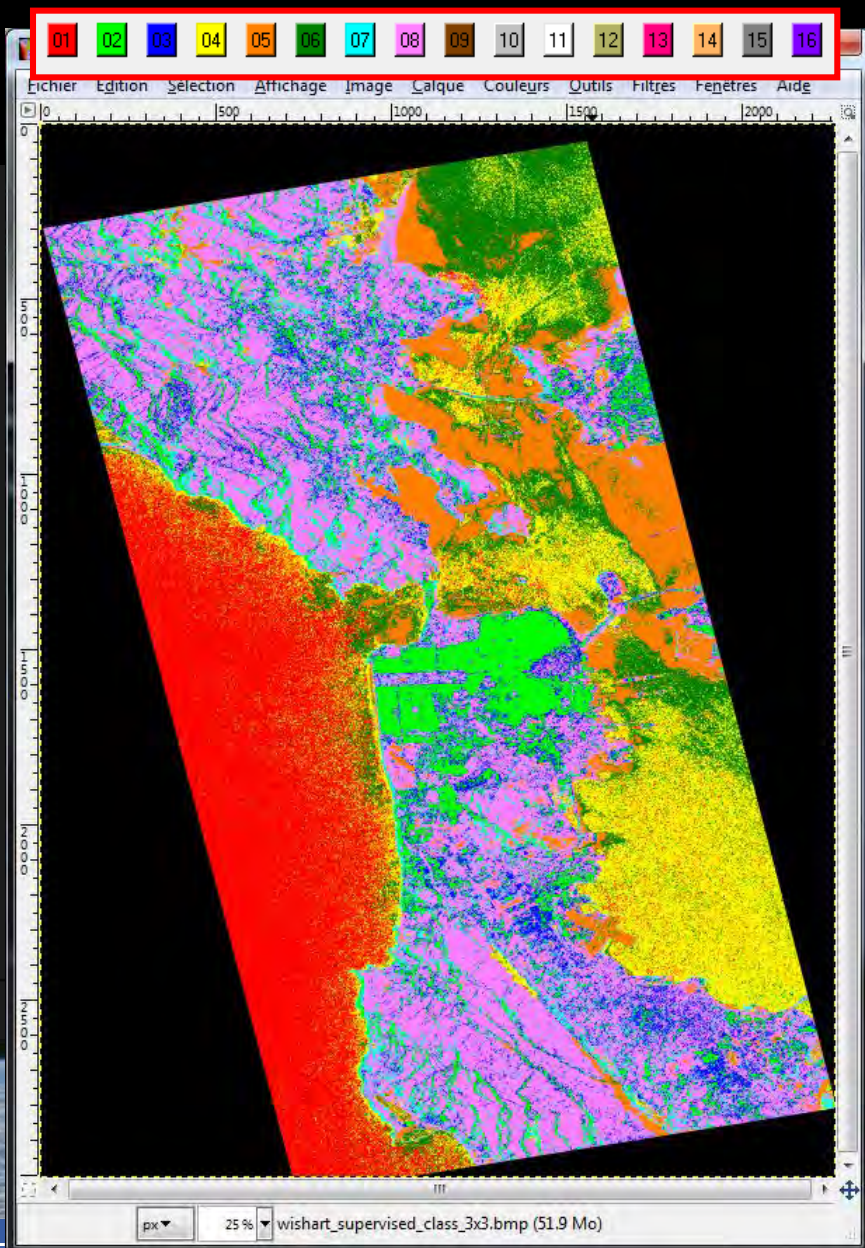
Supervised_class_X.bmp
Supervised_class_rej_X.bmp
Classified_cluster_set.bmp
Classified_cluster_set_rej.bmp

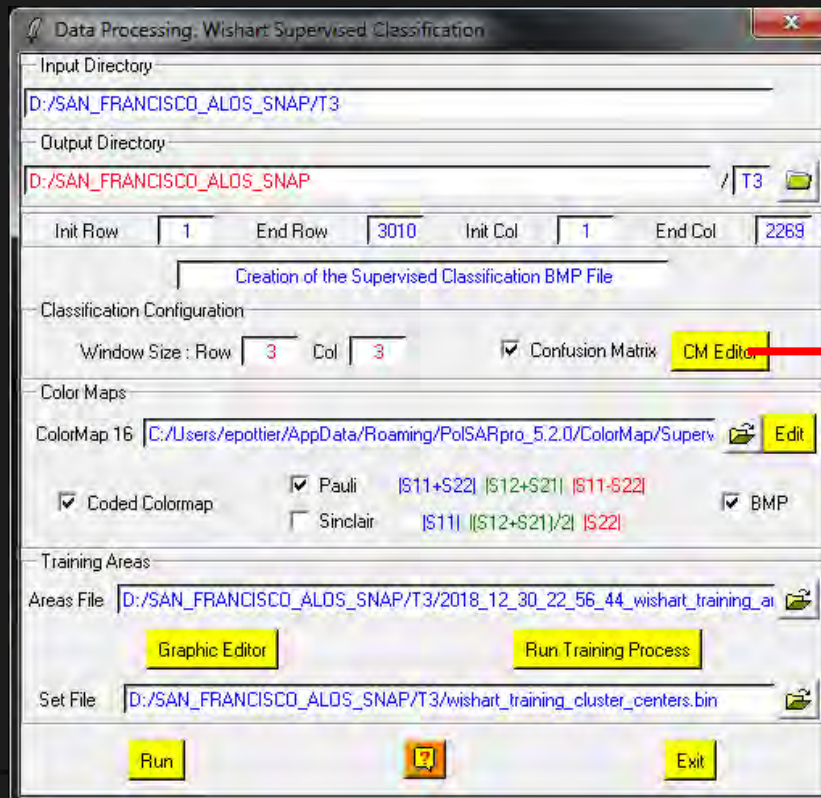
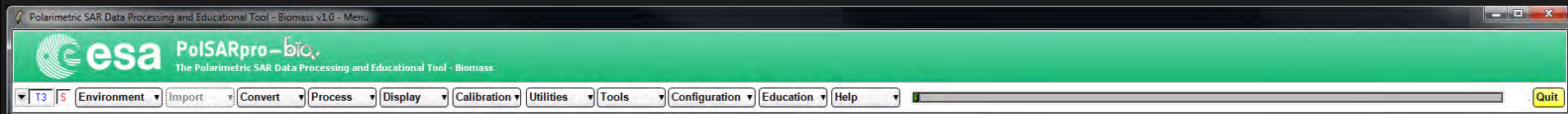
X = window size

Do it Yourself:

- 1) Run Training Process
- 2) Run
- 3) View the corresponding BMP files.







CONFUSION MATRIX

Rows represent the user defined clusters
Columns represent the segmented clusters
A number located at a position IJ represents the amount of pixels in percent belonging to the user defined area I that were assigned to cluster J during the supervised classification

	C1	C2	C3	C4	C5	C6	C7	C8
C1	91.53	0.00	0.00	7.47	0.00	0.99	0.00	0.00
C2	0.00	97.14	1.97	0.00	0.00	0.00	0.38	0.52
C3	0.00	2.80	20.60	0.20	1.79	0.23	14.89	59.50
C4	9.84	0.01	0.02	81.16	0.00	8.91	0.03	0.02
C5	0.03	0.00	0.00	2.62	85.48	10.57	0.00	1.30
C6	0.37	0.00	0.00	12.69	8.56	78.36	0.01	0.01
C7	0.08	5.99	5.63	1.76	1.33	0.27	14.91	70.03
C8	0.00	2.95	7.02	0.05	0.06	0.01	5.71	84.19

Class populations

C1	132804
C2	23357
C3	6583
C4	61976
C5	3775
C6	58901
C7	25125
C8	40867



Questions ?

