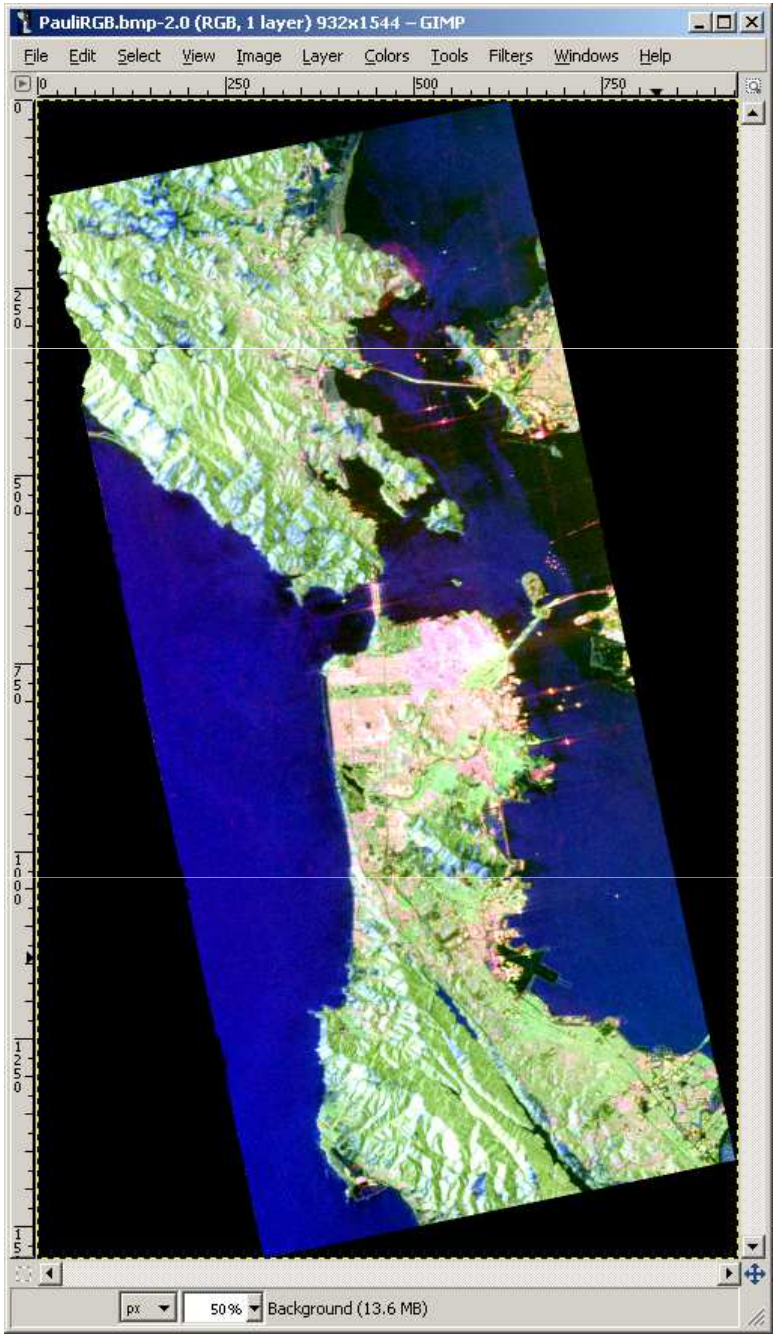
PRACTICAL PART - 2

Earth Observation Scientific Investigator Package

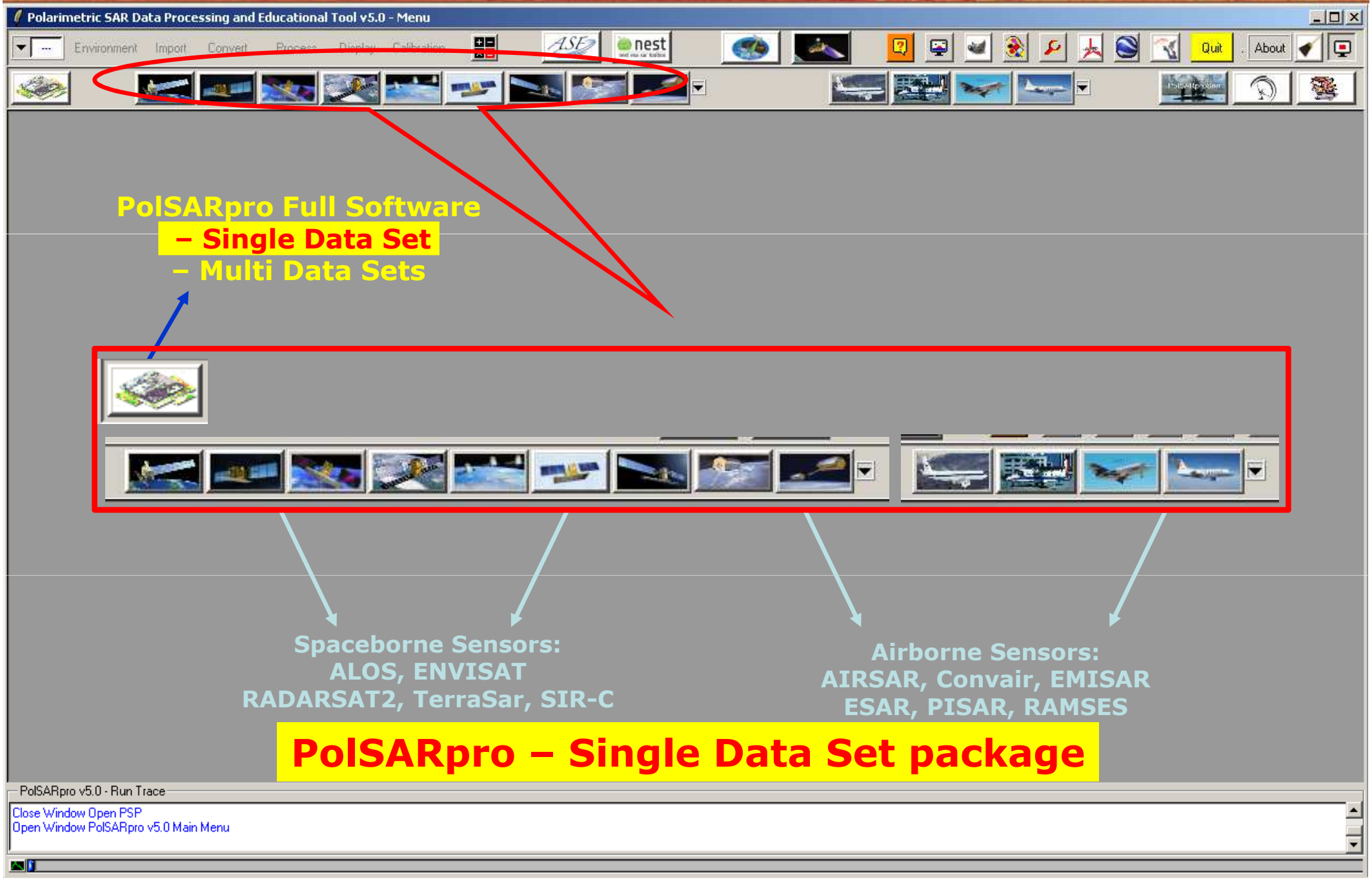
Single Data Set Package

Multi Data Set Package

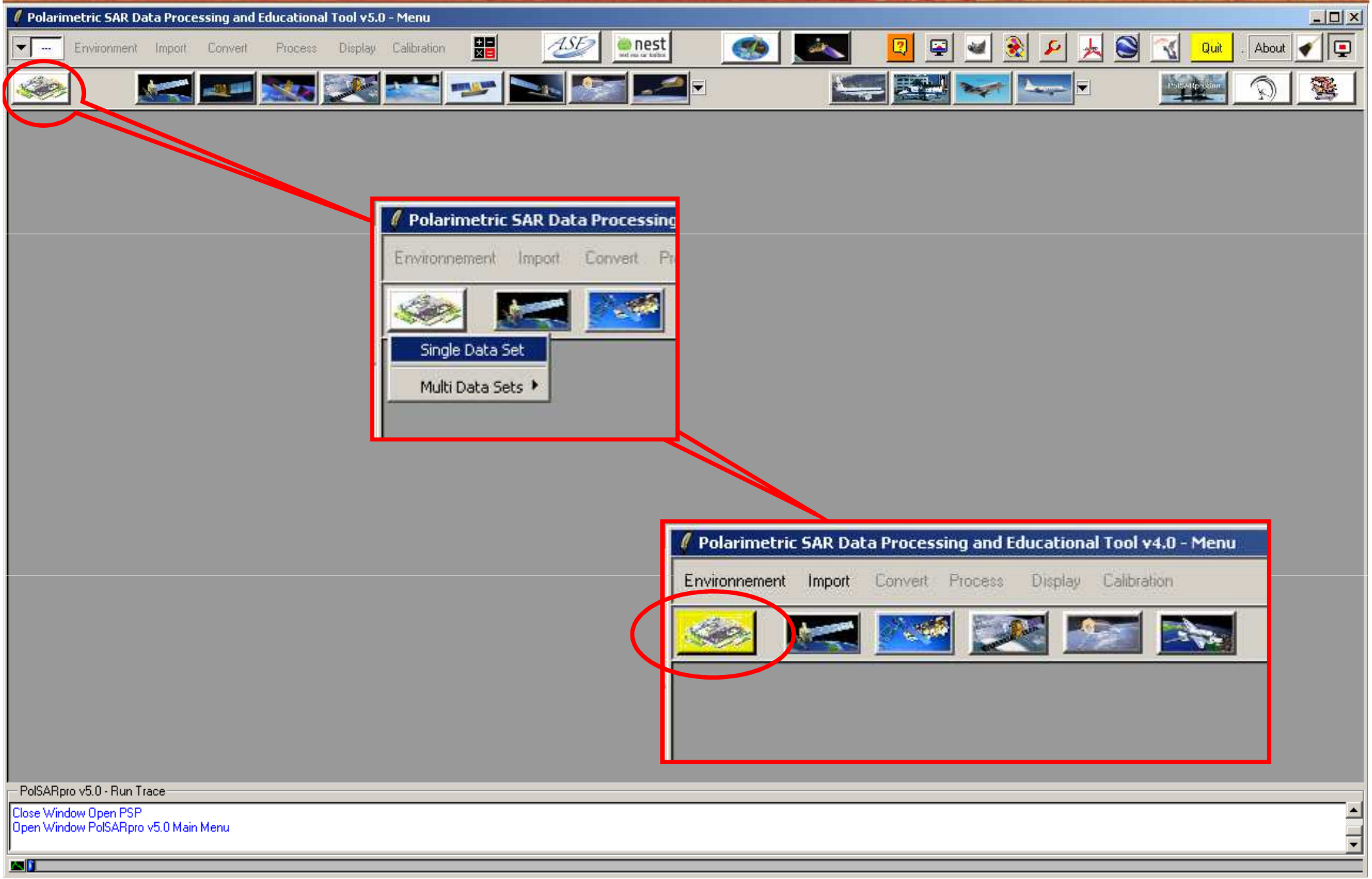


ALOS : Advanced Land Observing Satellite
PALSAR : Phase Array L-Band SAR

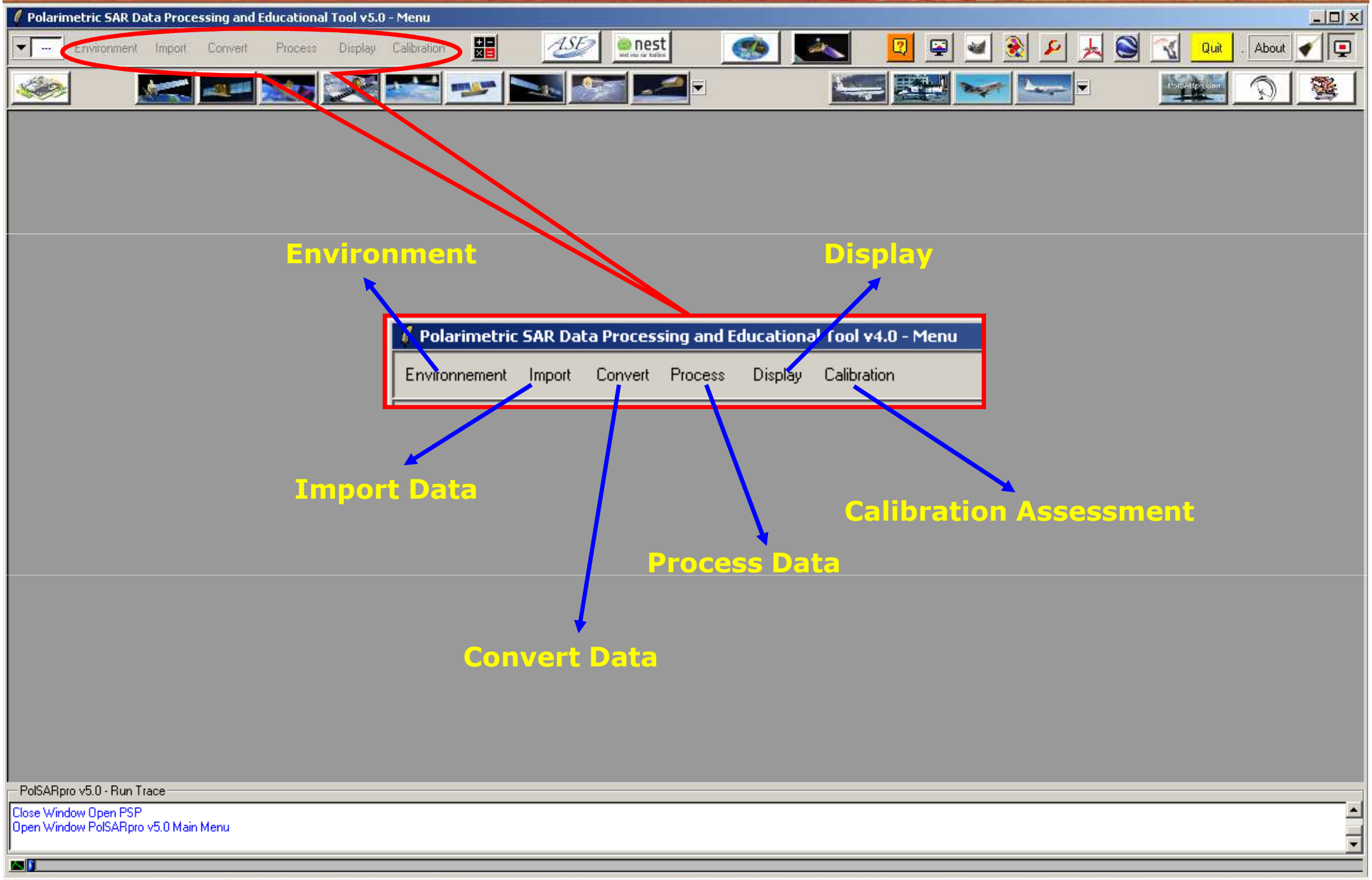
PolSARpro v5.0 SOFTWARE



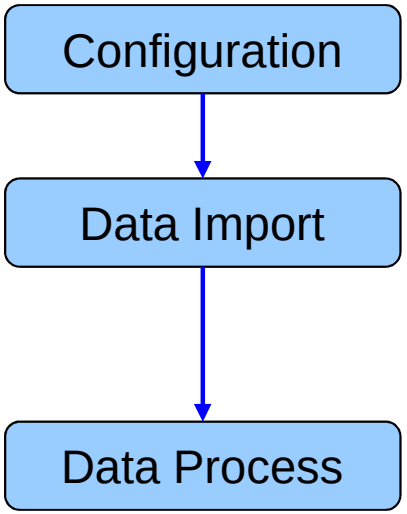
MAIN MENU


Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu
Environment
Import
Convert
Process
Display
Calibration
Quit
About
Polarimetric SAR Data Processing
Environnement
Import
Convert
Single Data Set
Multi Data Sets
Polarimetric SAR Data Processing and Educational Tool v4.0 - Menu
Environnement
Import
Convert
Process
Display
Calibration
PolSARpro v5.0 - Run Trace
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

MAIN MENU


Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu
Environment
Import
Convert
Process
Display
Calibration
Quit
About
Environment
Display
Polarimetric SAR Data Processing and Educational Tool v4.0 - Menu
Environnement
Import
Convert
Process
Display
Calibration
Import Data
Calibration Assessment
Process Data
Convert Data
PolSARpro v5.0 - Run Trace
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

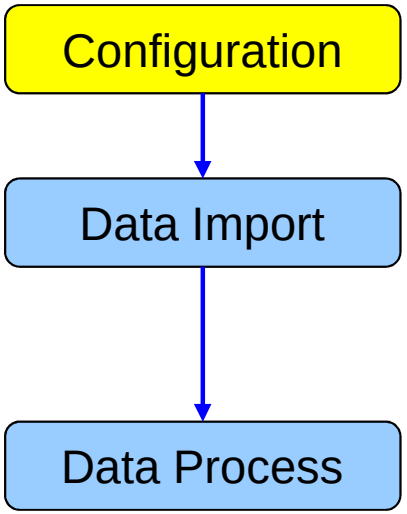
PROCESSING CHAIN



- Input Data File:
  - Spaceborne Sensors
- Extract Raw Data

- Eigenvalue Parameters
- Polarimetric Decomposition
  - Freeman
  - Van Zyl
- Polarimetric Functionalities
  - Polarimetric Synthesis
  - Polarimetric Signatures
  - Polarized Point Scatterer Detection
- Polarimetric Segmentation
  - Wishart - H / A / alpha classification
  - Supervised Wishart classification
  - Support Vector Machine Classification

PROCESSING CHAIN



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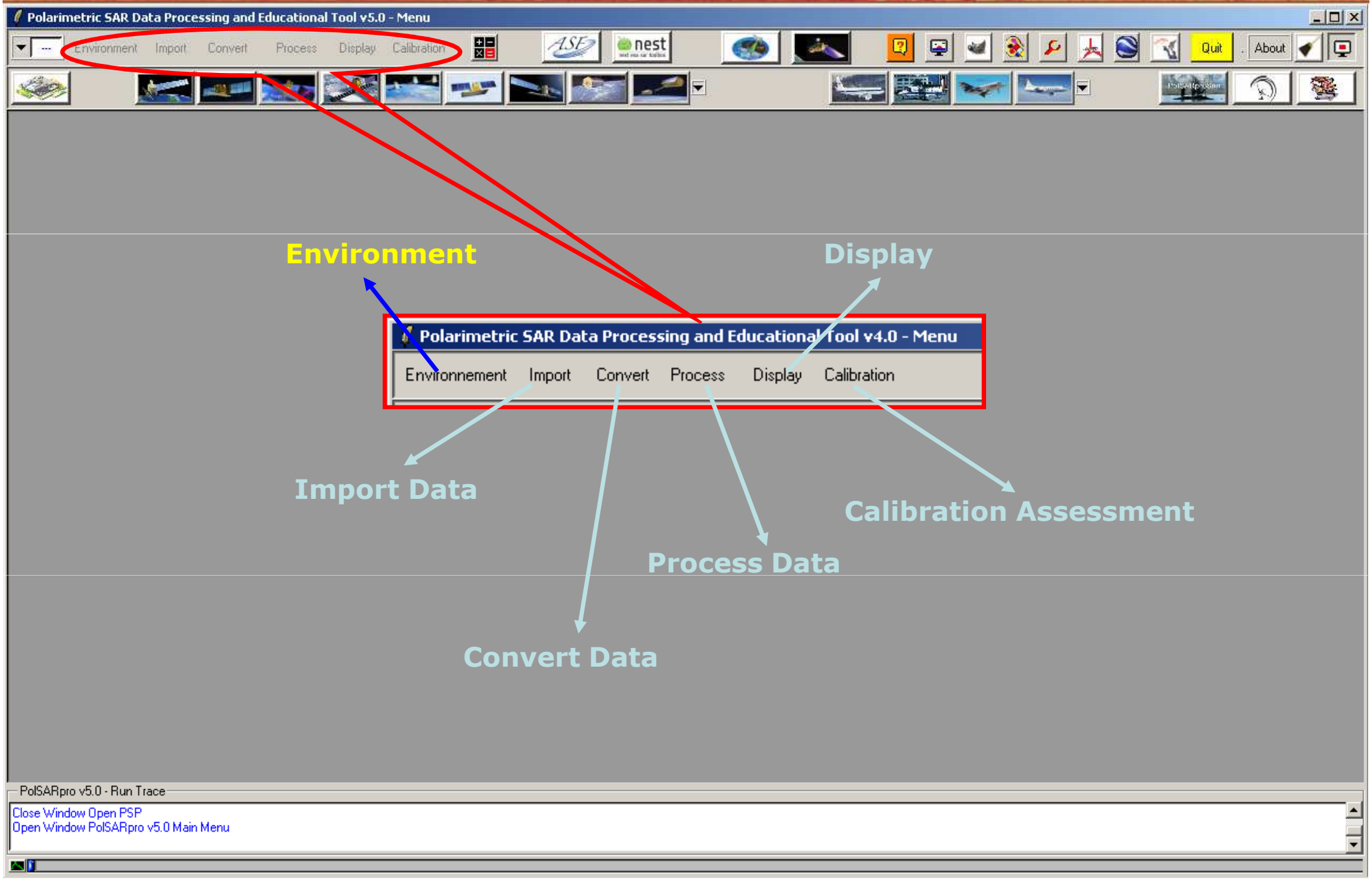
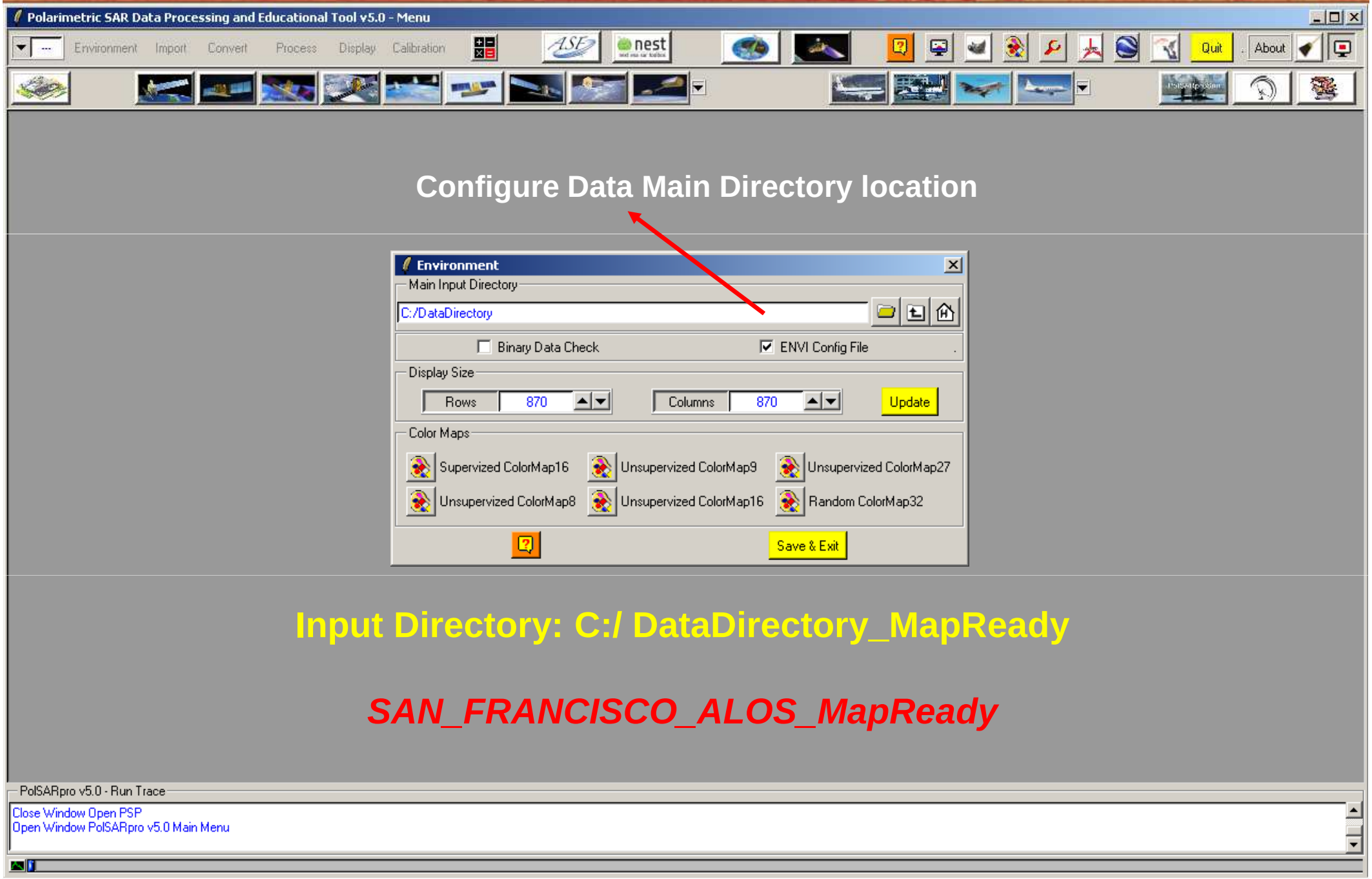
ENVIRONNEMENT



ENVIRONMENT



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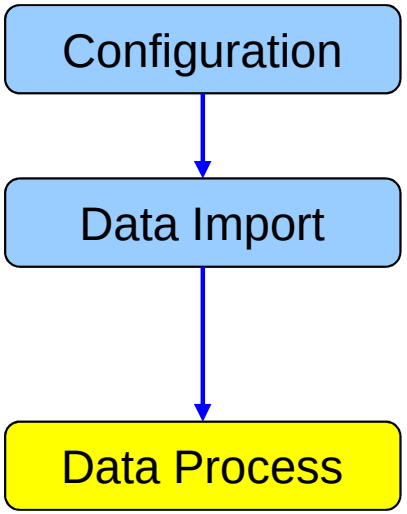

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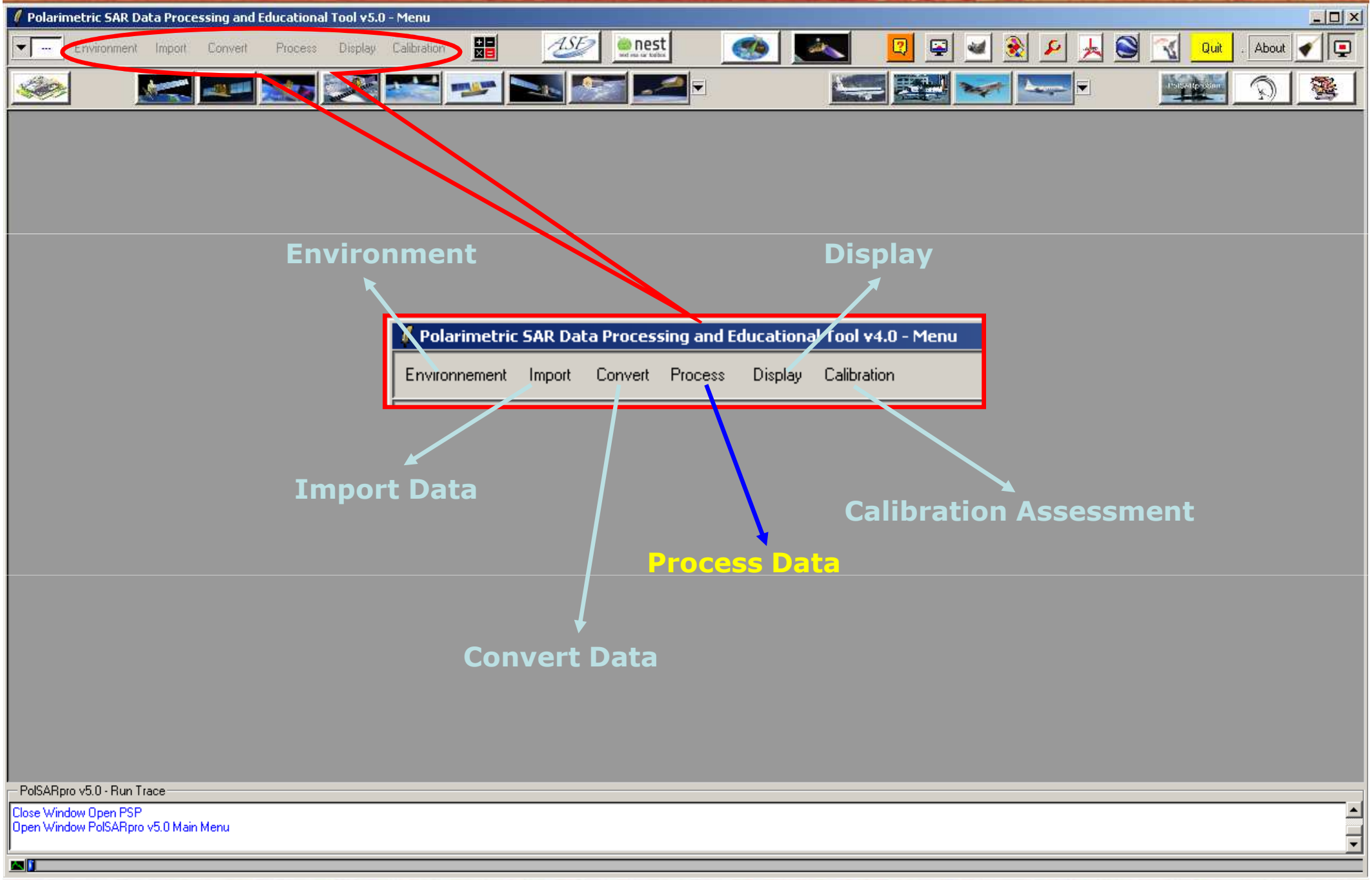

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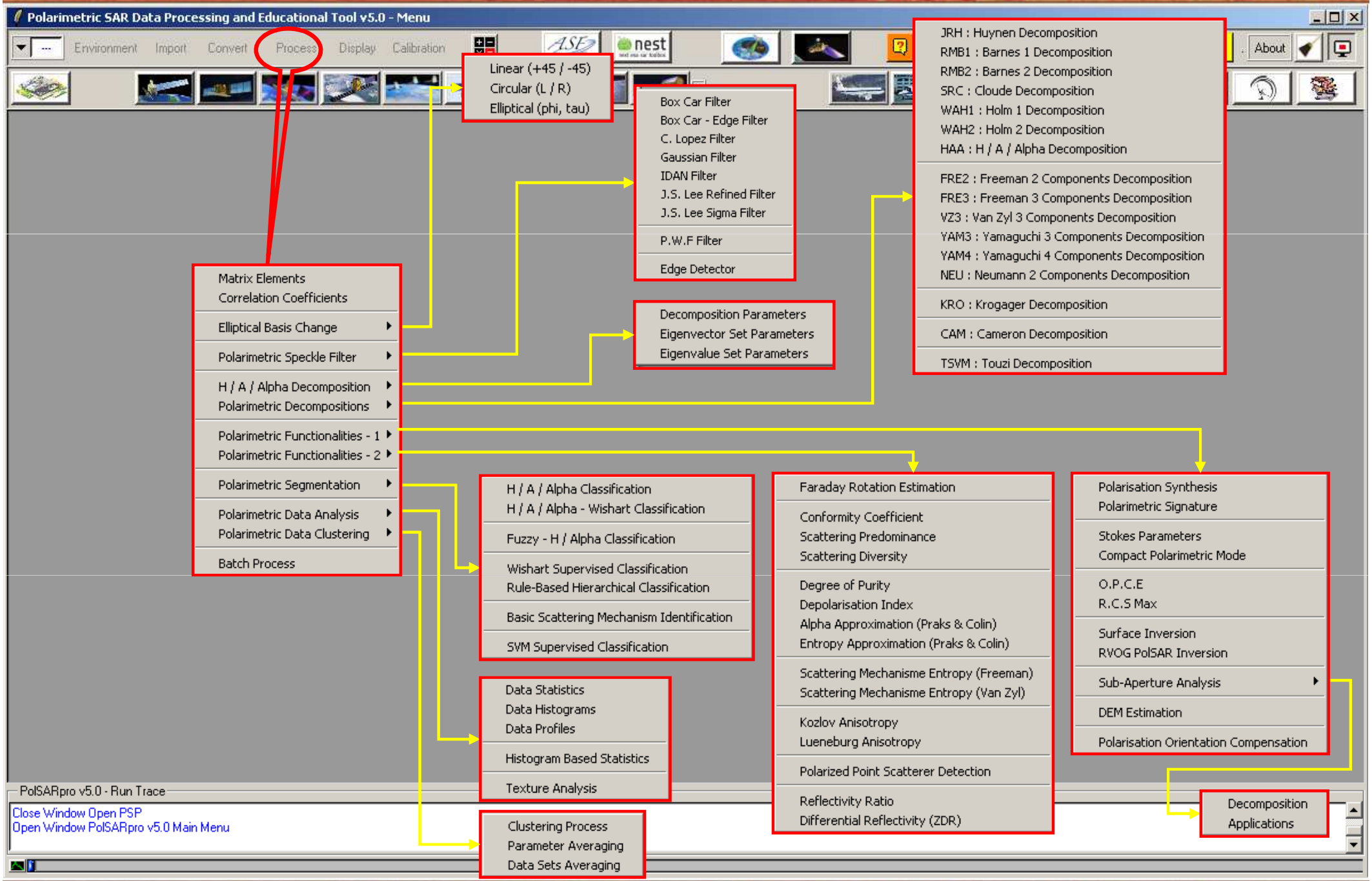
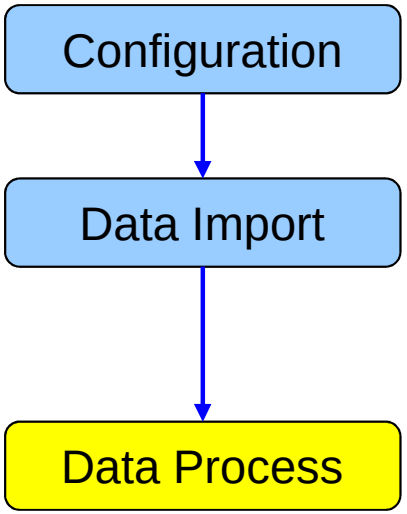


PROCESSING CHAIN



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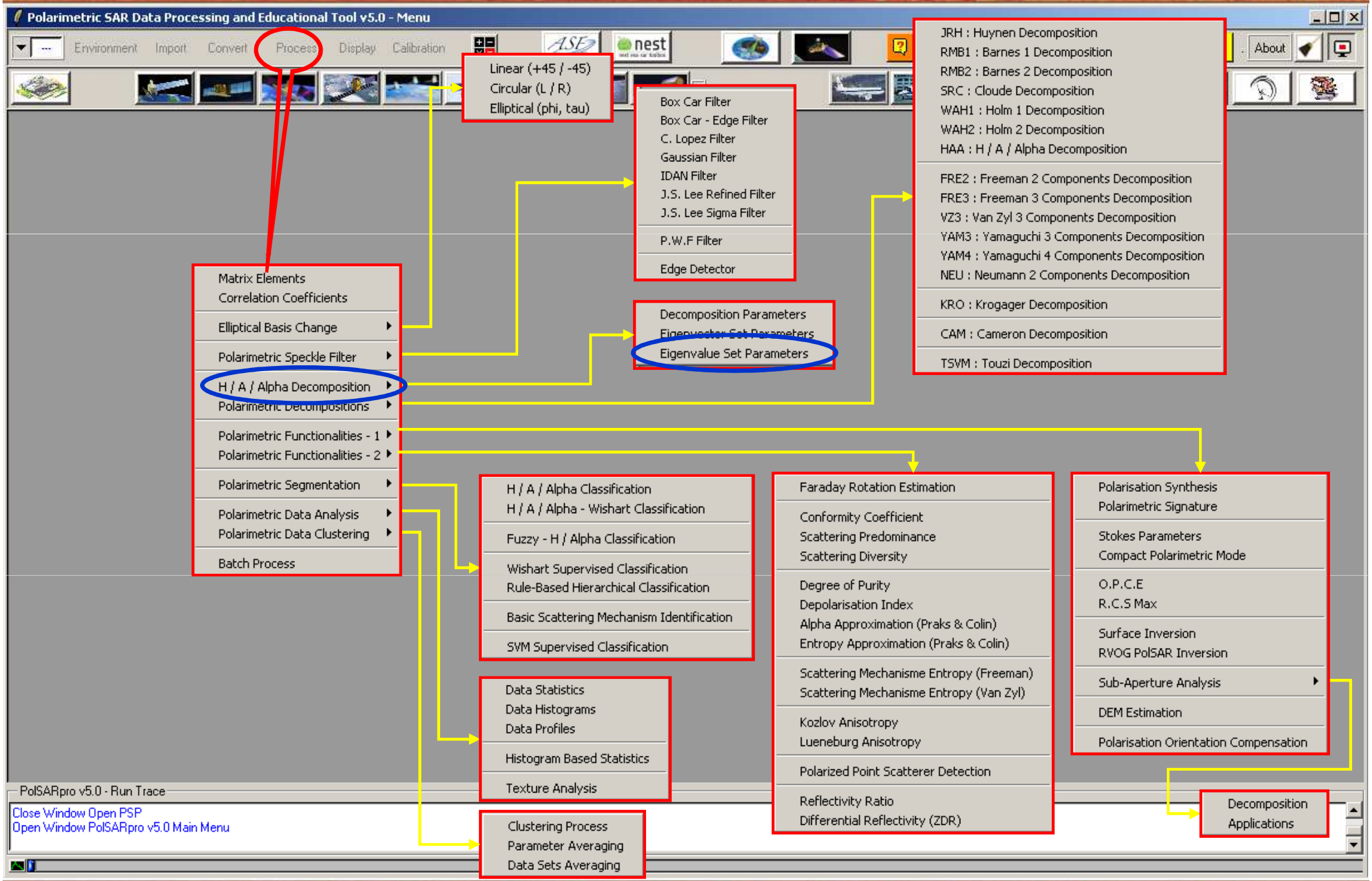
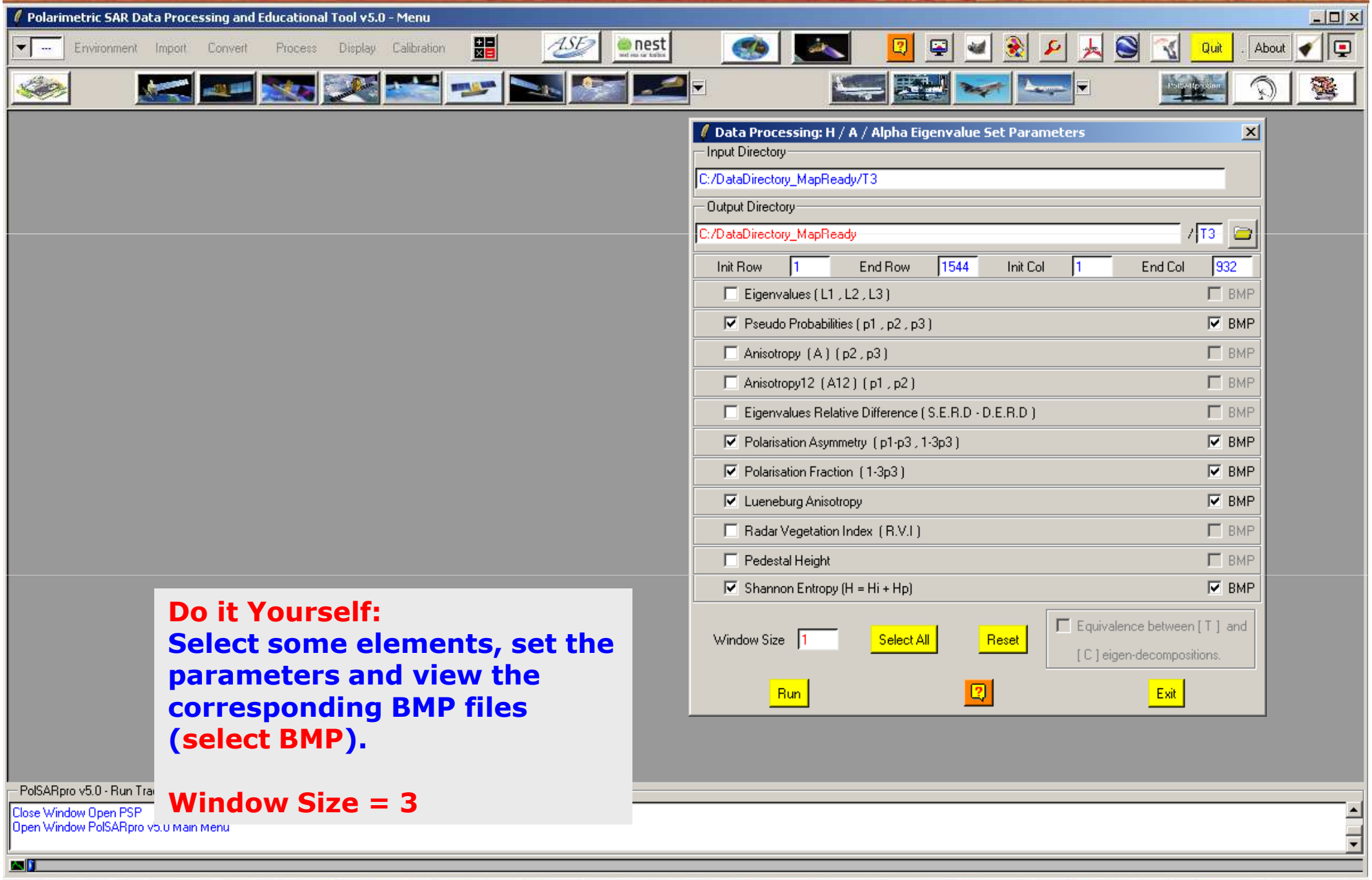


EIGENVALUE SET PARAMETERS

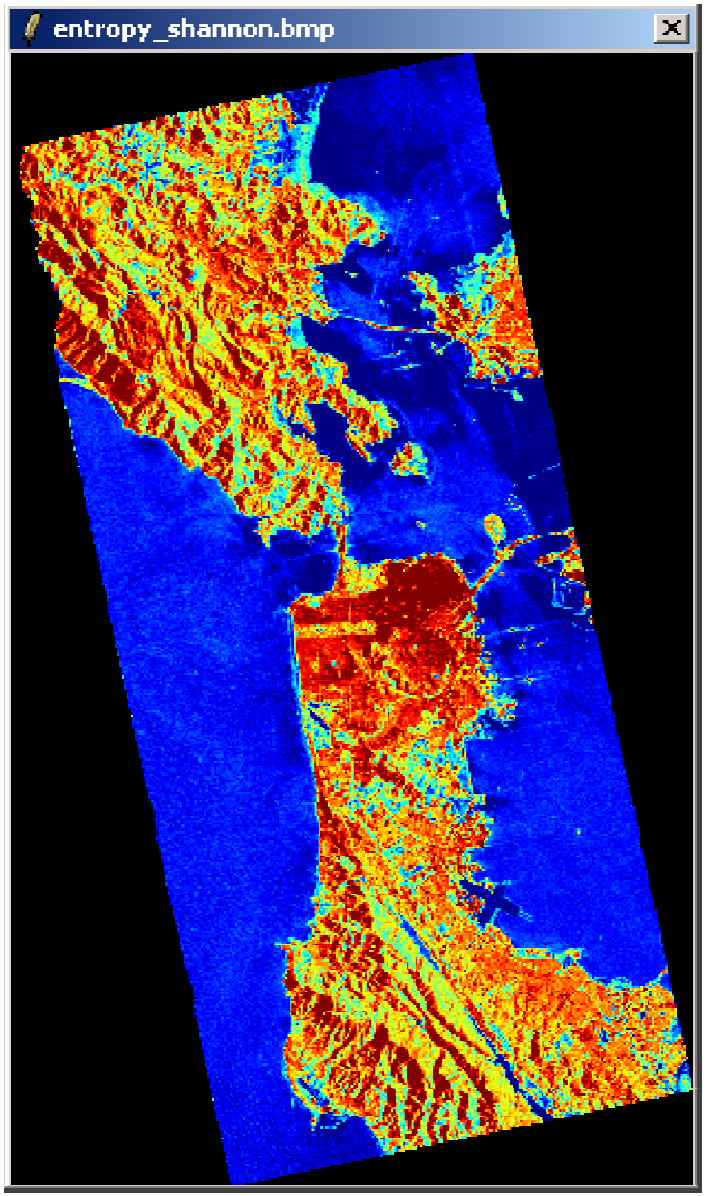


Do it Yourself:
Select some elements, set the parameters and view the corresponding BMP files (select BMP).

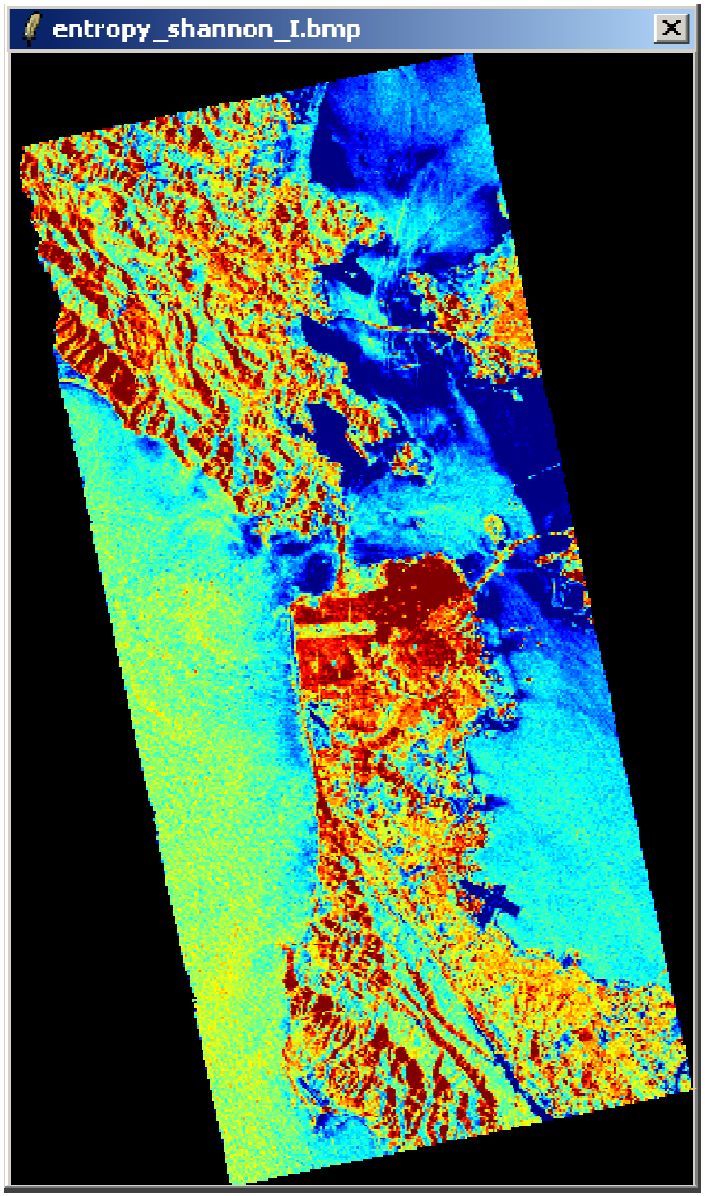
Window Size = 3

EIGENVALUE SET PARAMETERS

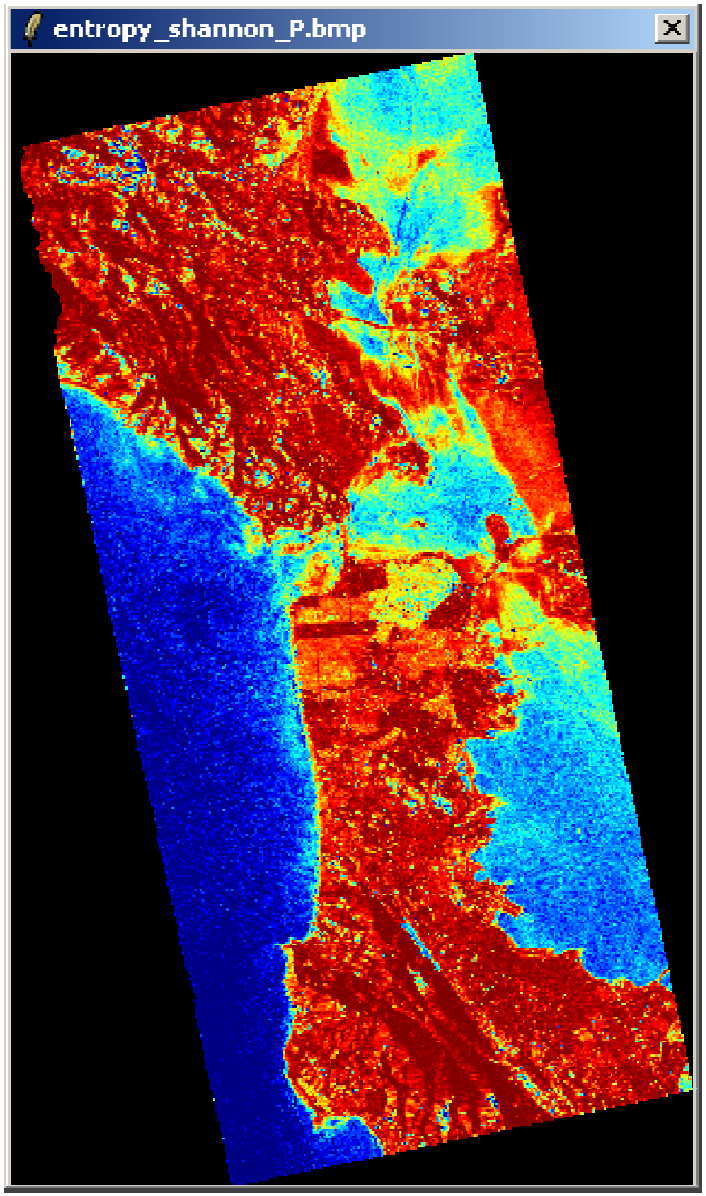
Entropy Shannon



Entropy I

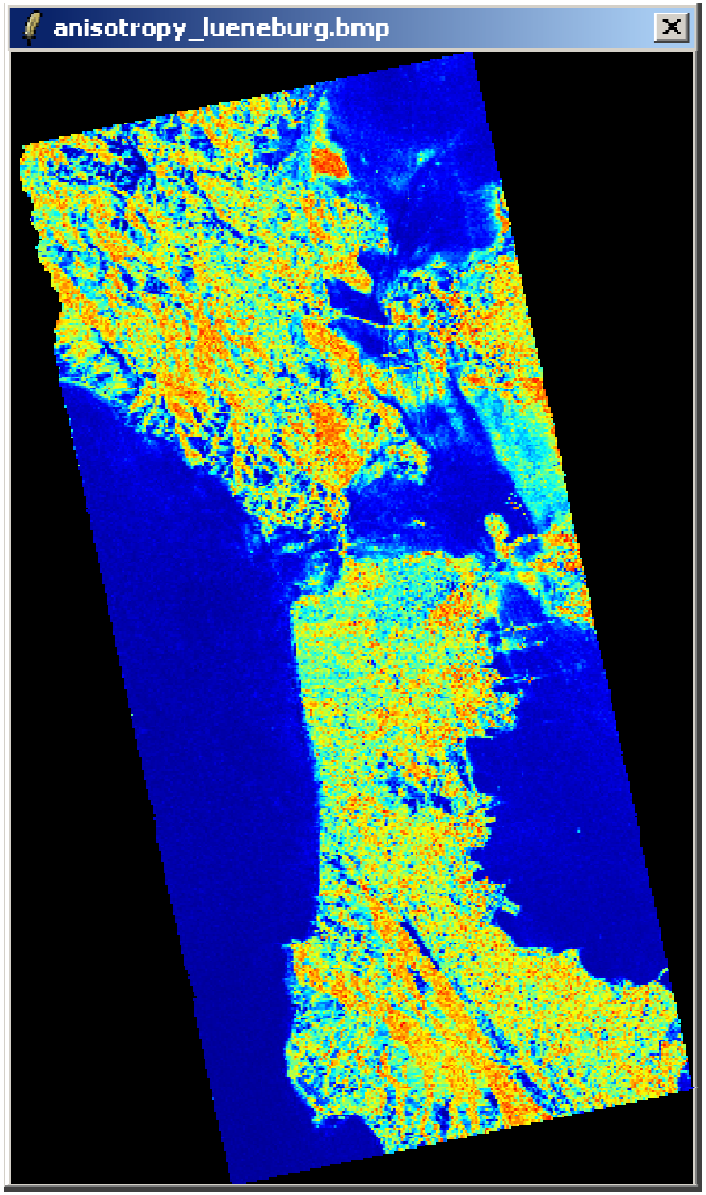


Entropy P

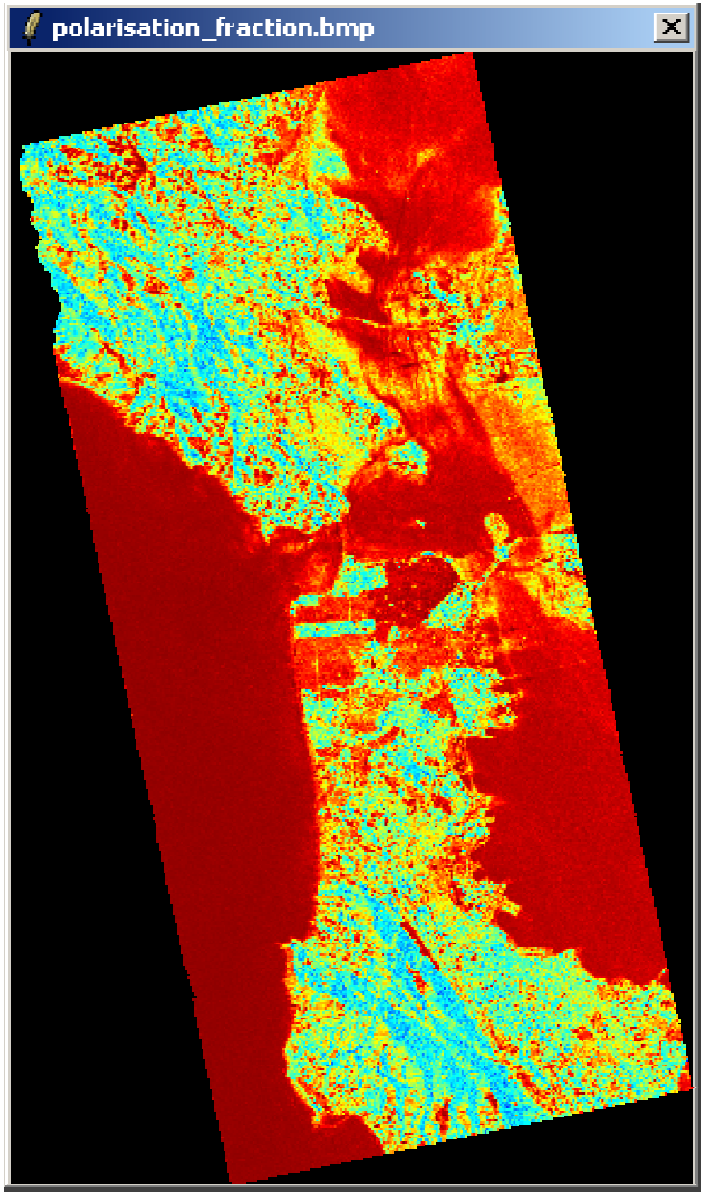


EIGENVALUE SET PARAMETERS

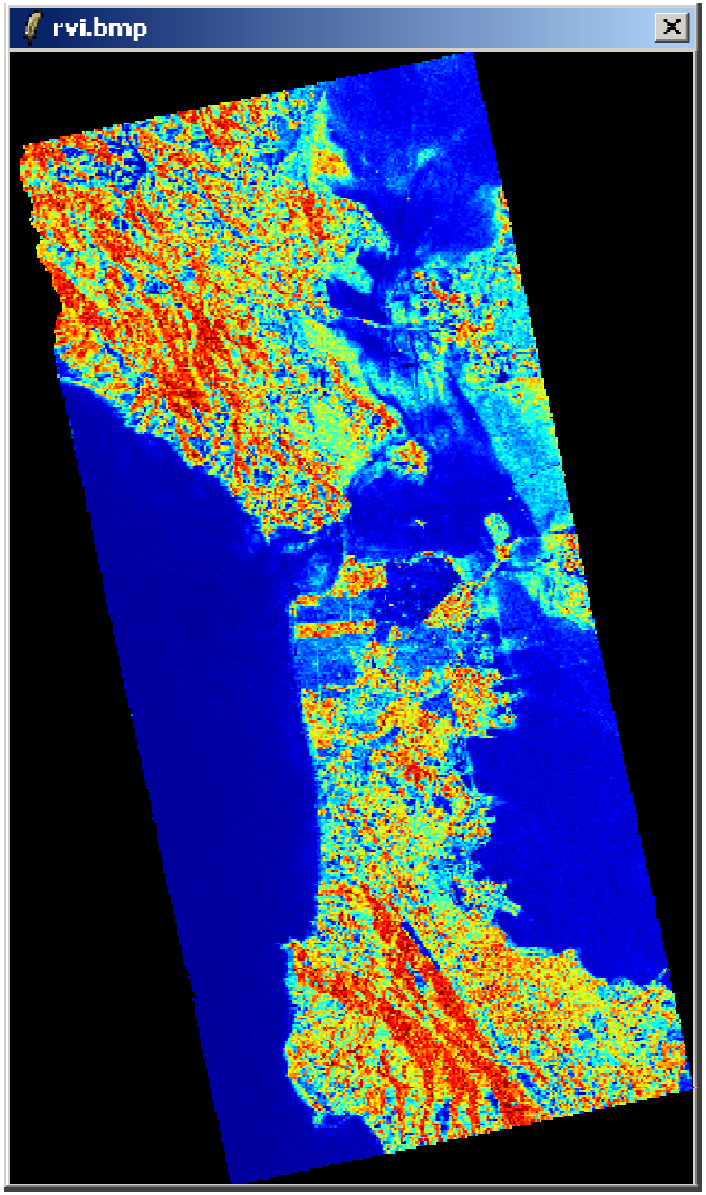
Anisotropy Lueneburg



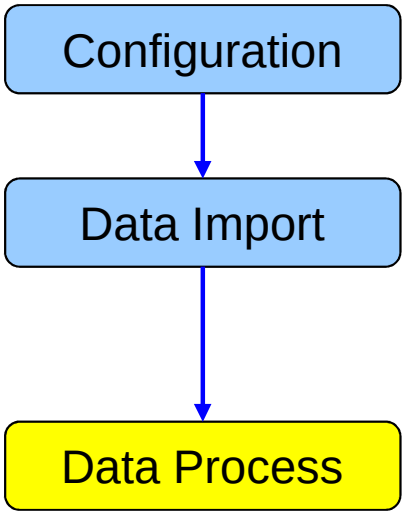
Polarisation Fraction



R.V.I



PROCESSING CHAIN



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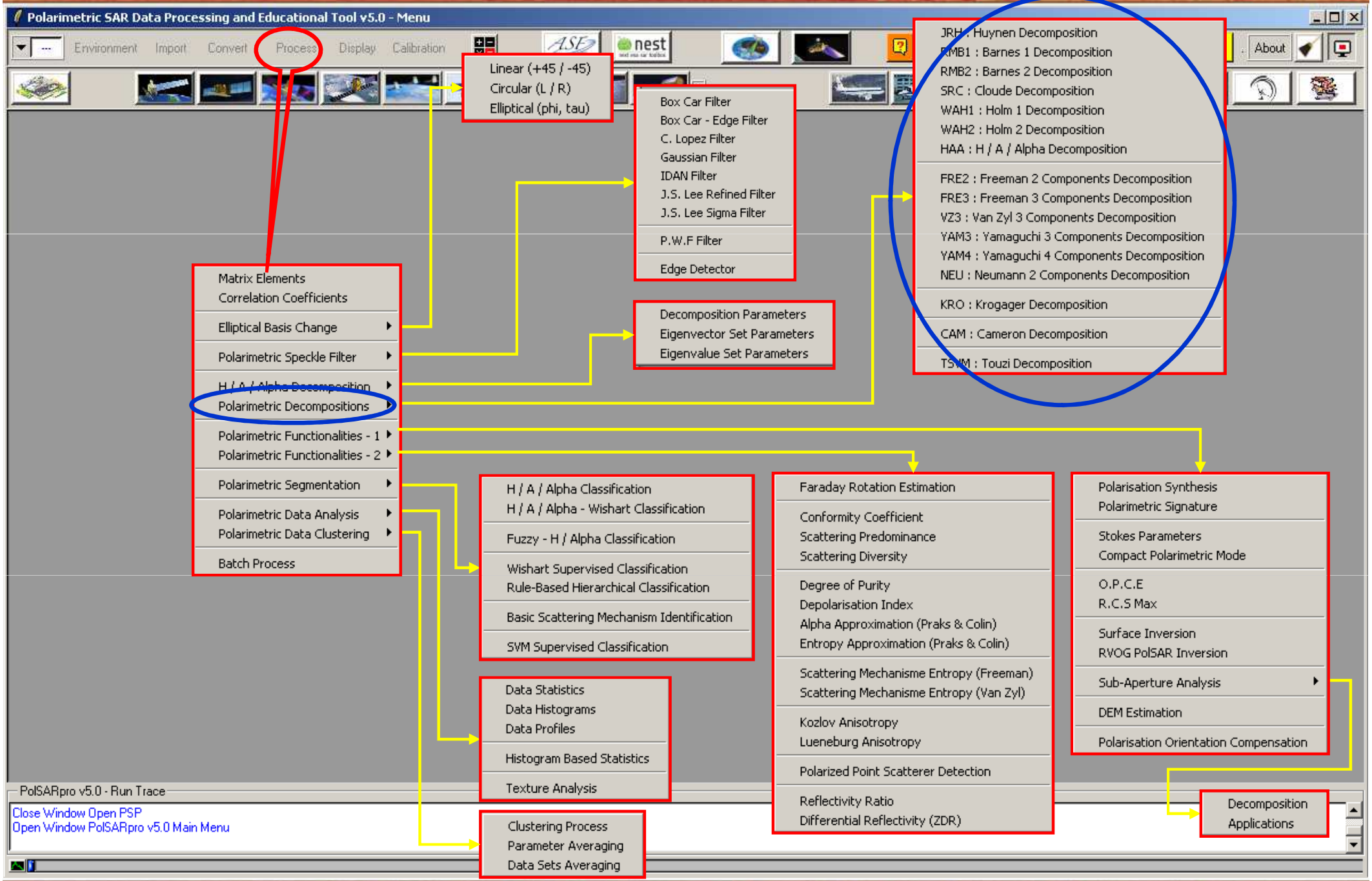
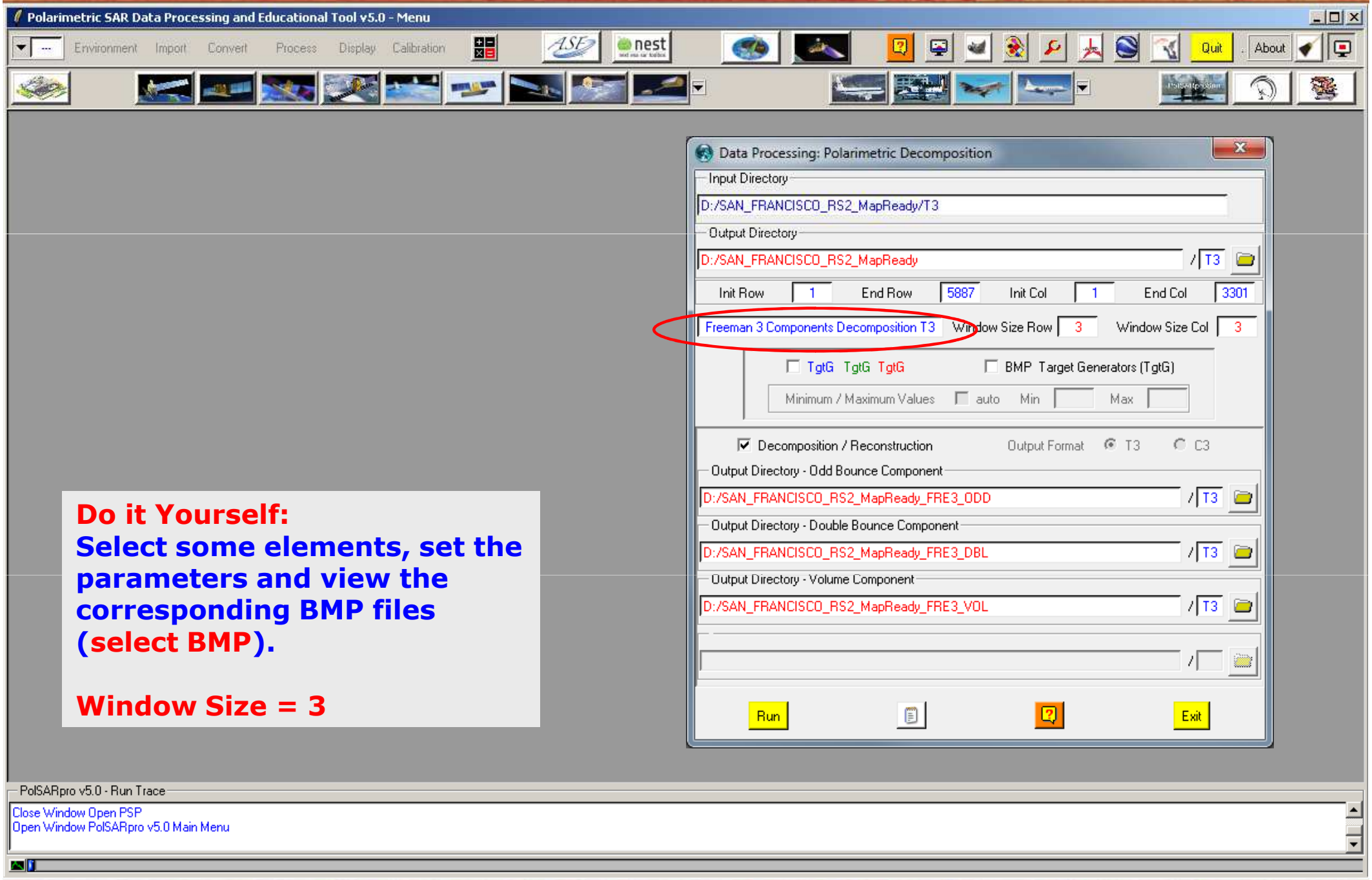
PROCESS DATA



POLARIMETRIC DECOMPOSITION



Do it Yourself:
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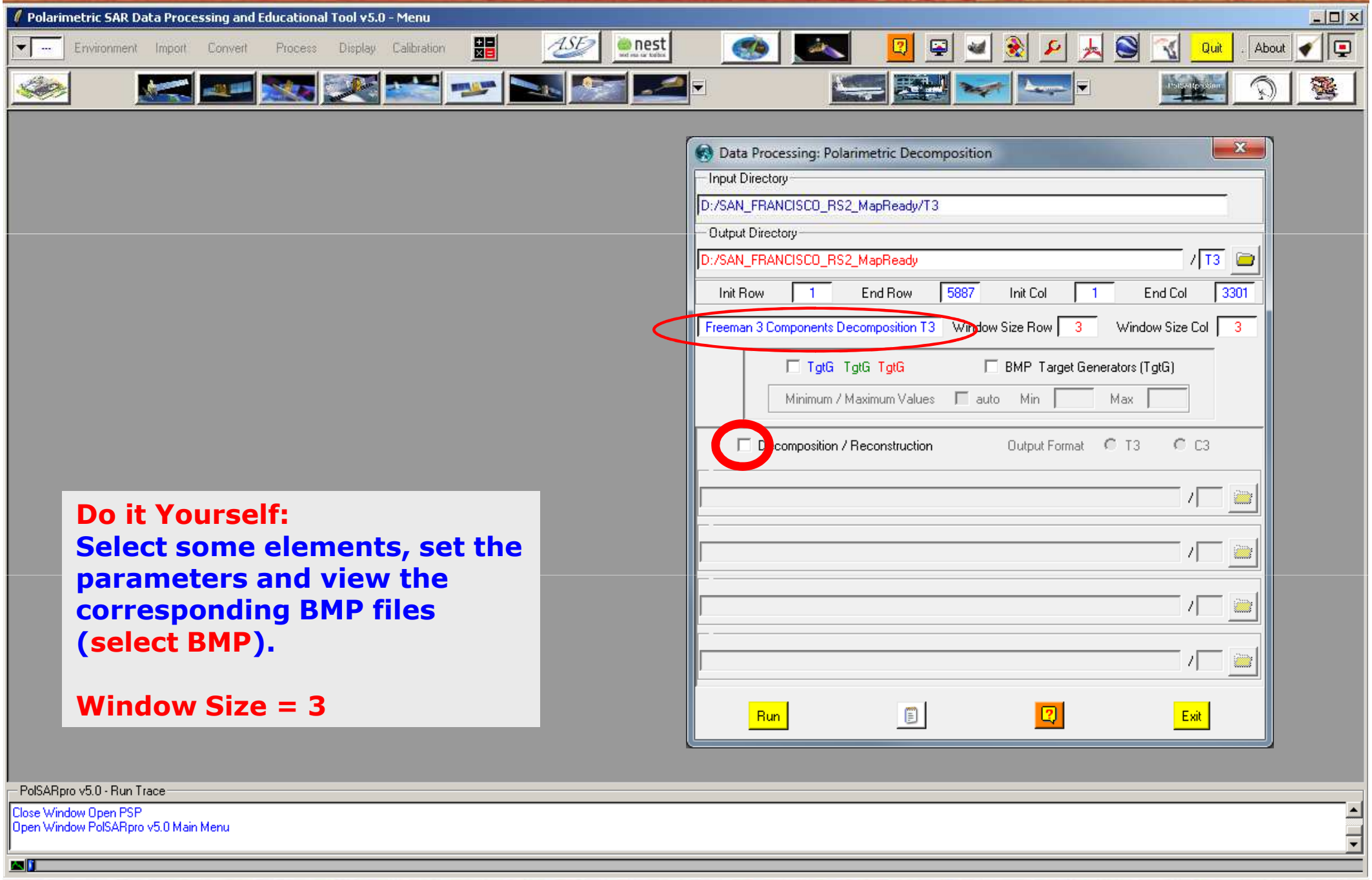
POLARIMETRIC DECOMPOSITION



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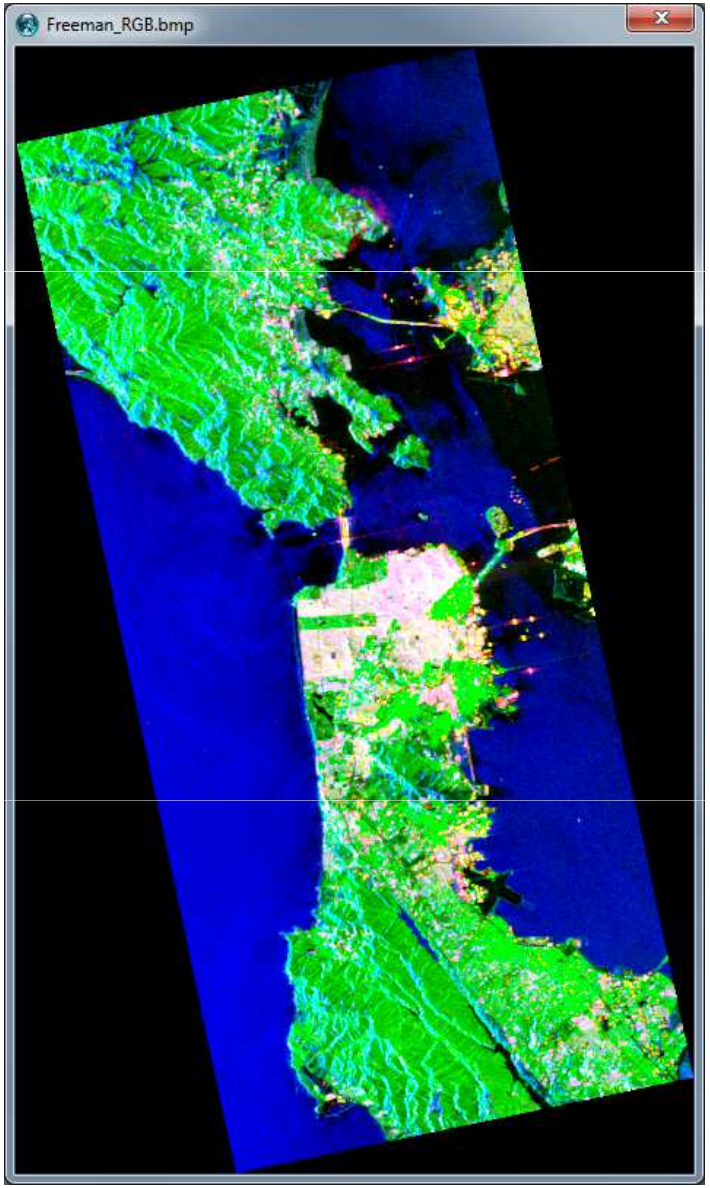
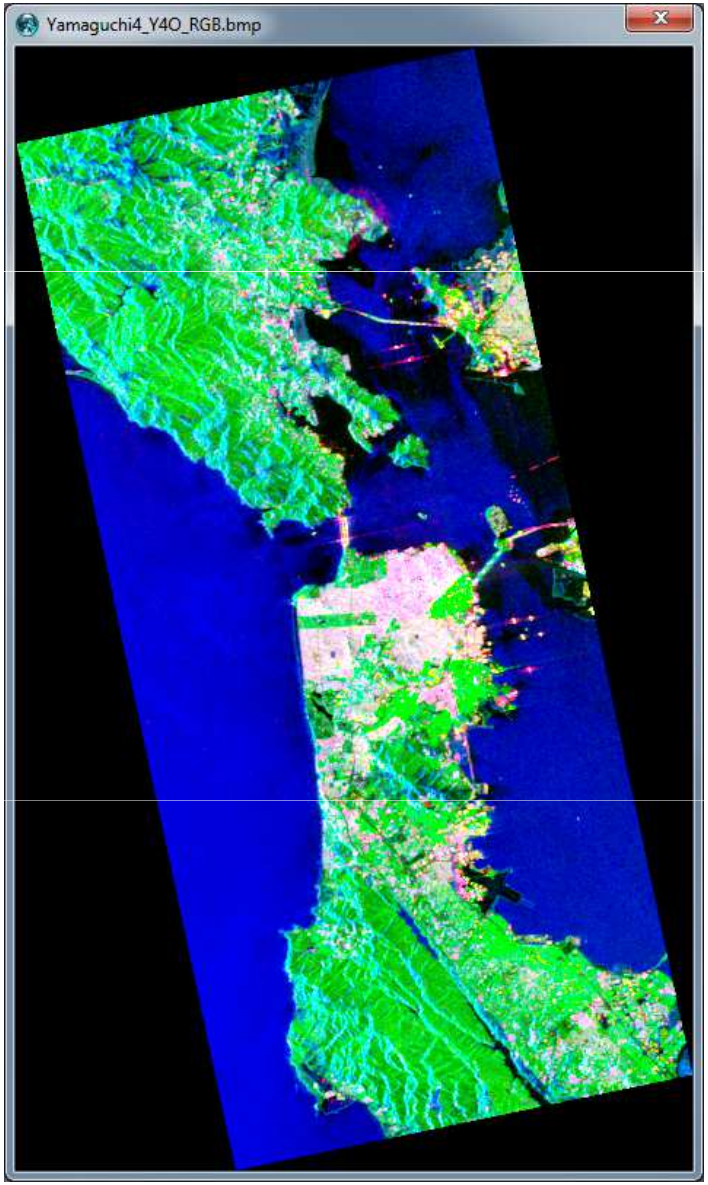
POLARIMETRIC DECOMPOSITION

Pauli Freeman 3



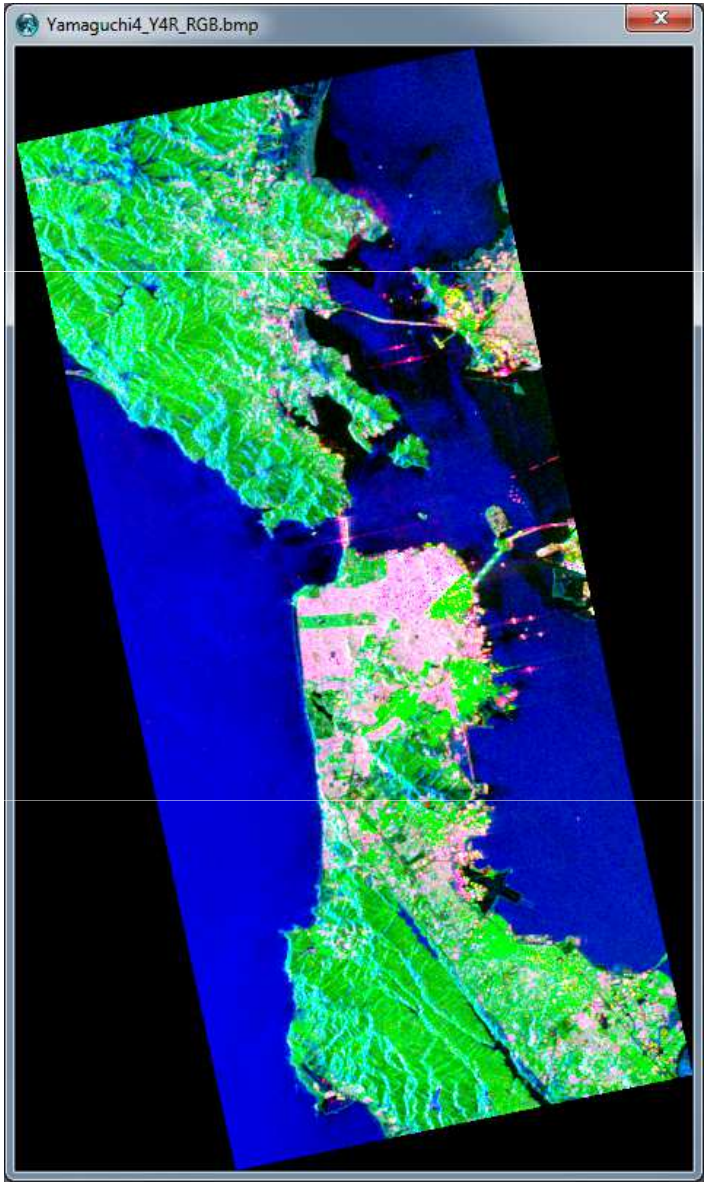
POLARIMETRIC DECOMPOSITION

Pauli Yamaguchi Y40



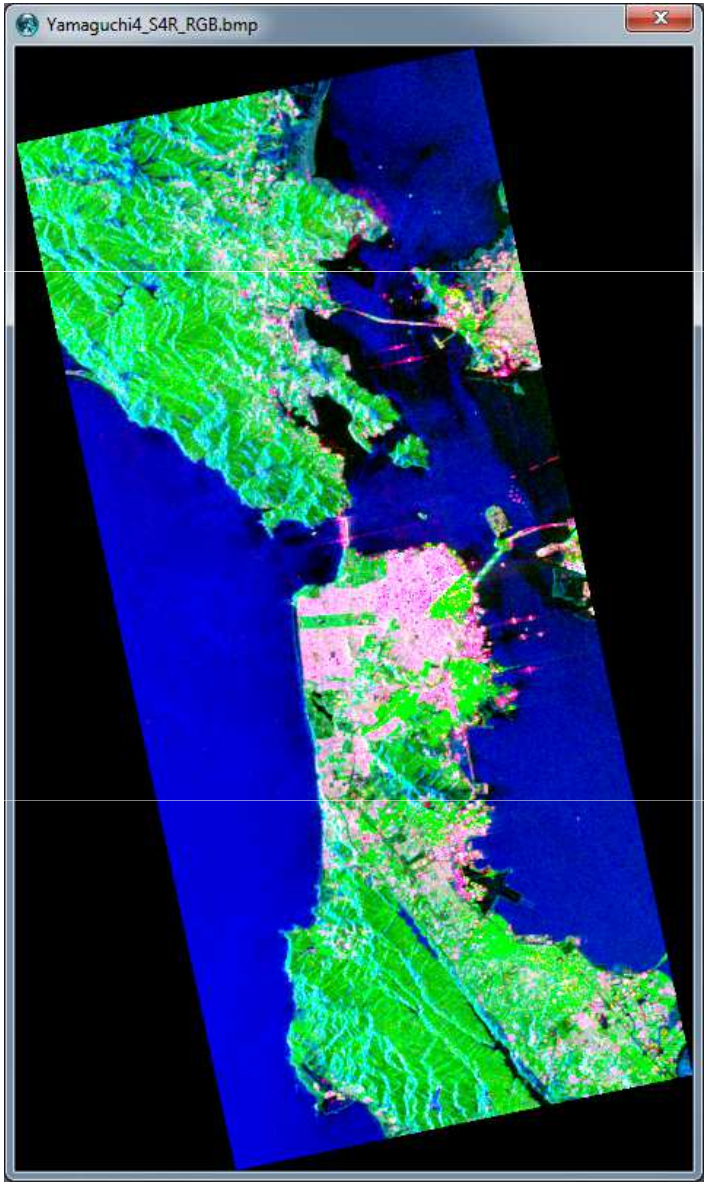
POLARIMETRIC DECOMPOSITION

Pauli Yamaguchi Y4R



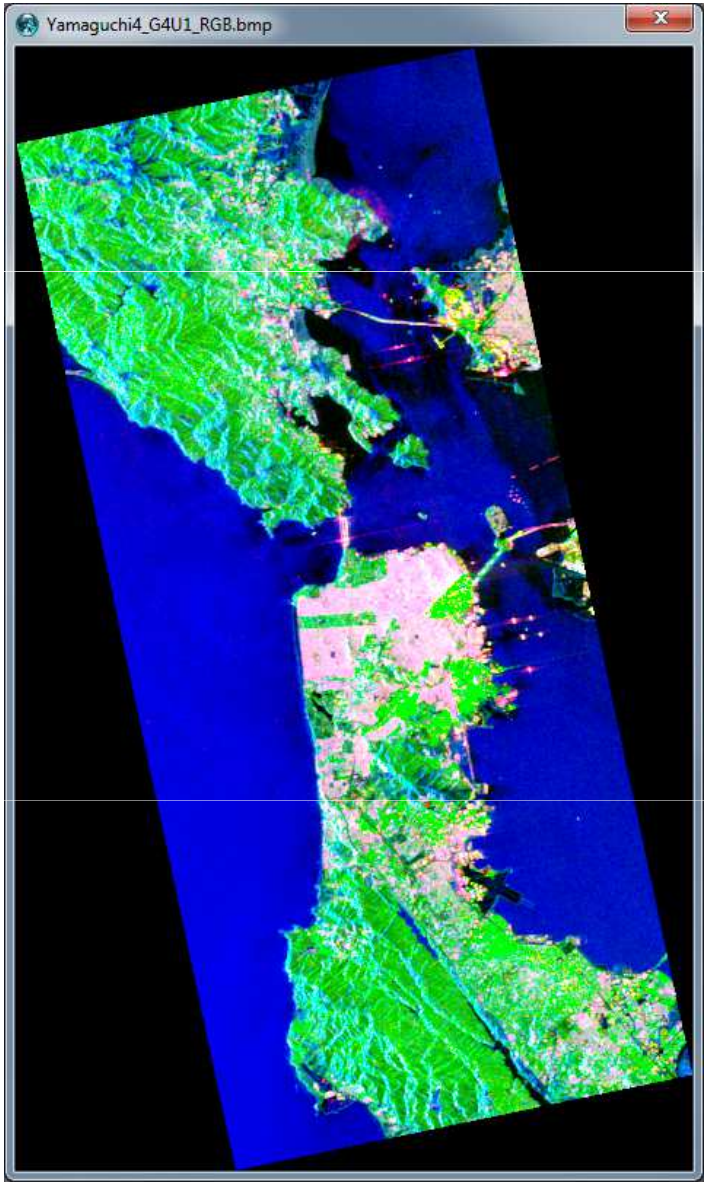
POLARIMETRIC DECOMPOSITION

Pauli Yamaguchi S4R



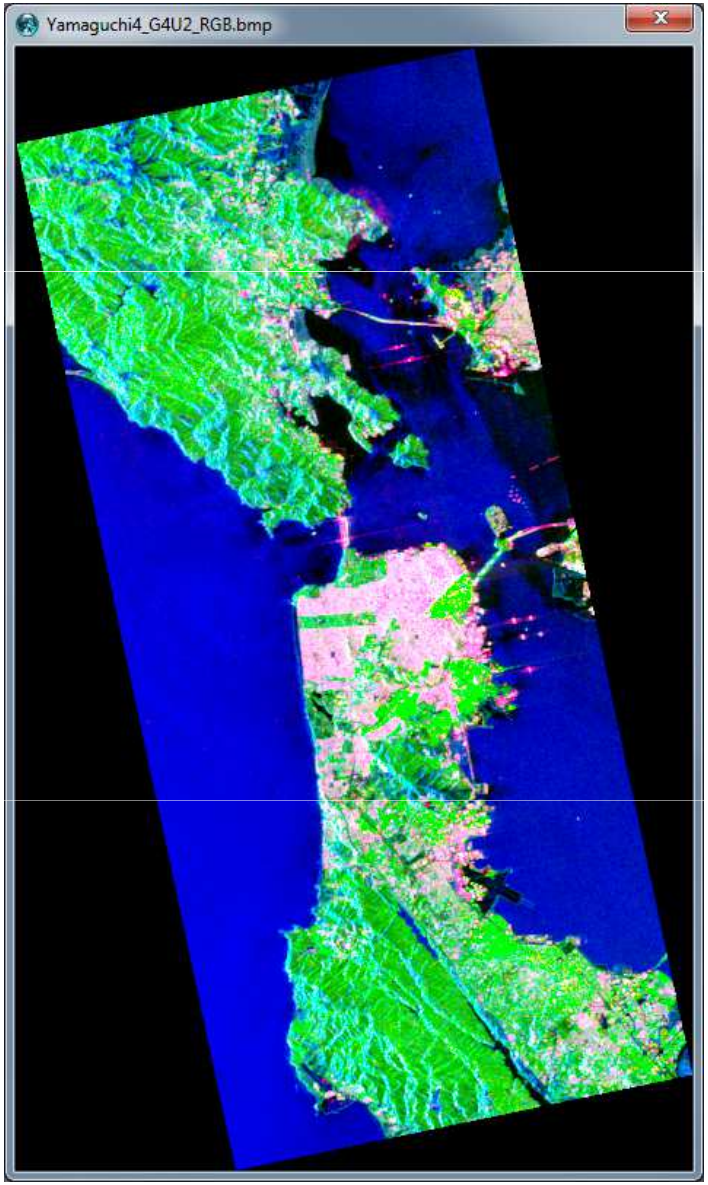
POLARIMETRIC DECOMPOSITION

Pauli Yamaguchi G4U1



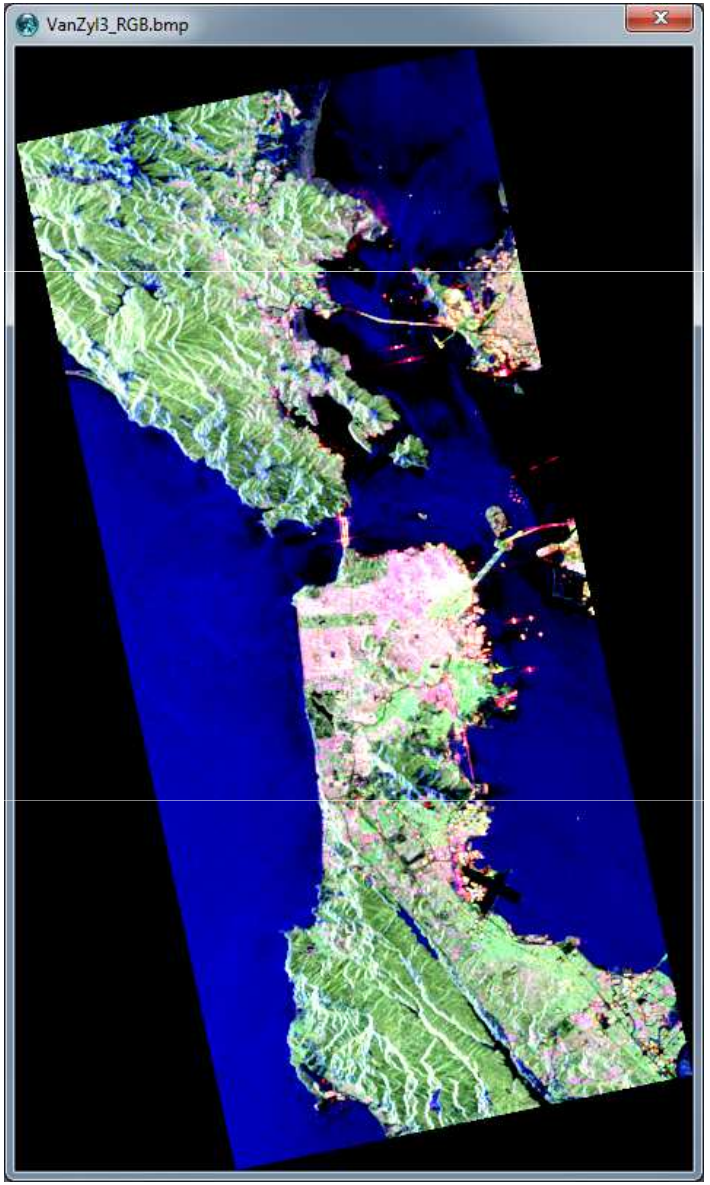
POLARIMETRIC DECOMPOSITION

Pauli Yamaguchi G4U2

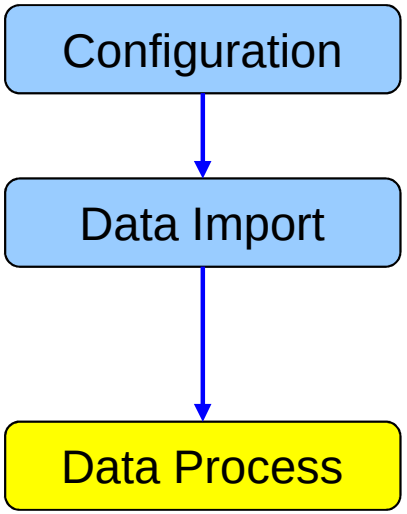


POLARIMETRIC DECOMPOSITION

Pauli Van Zyl 3



PROCESSING CHAIN



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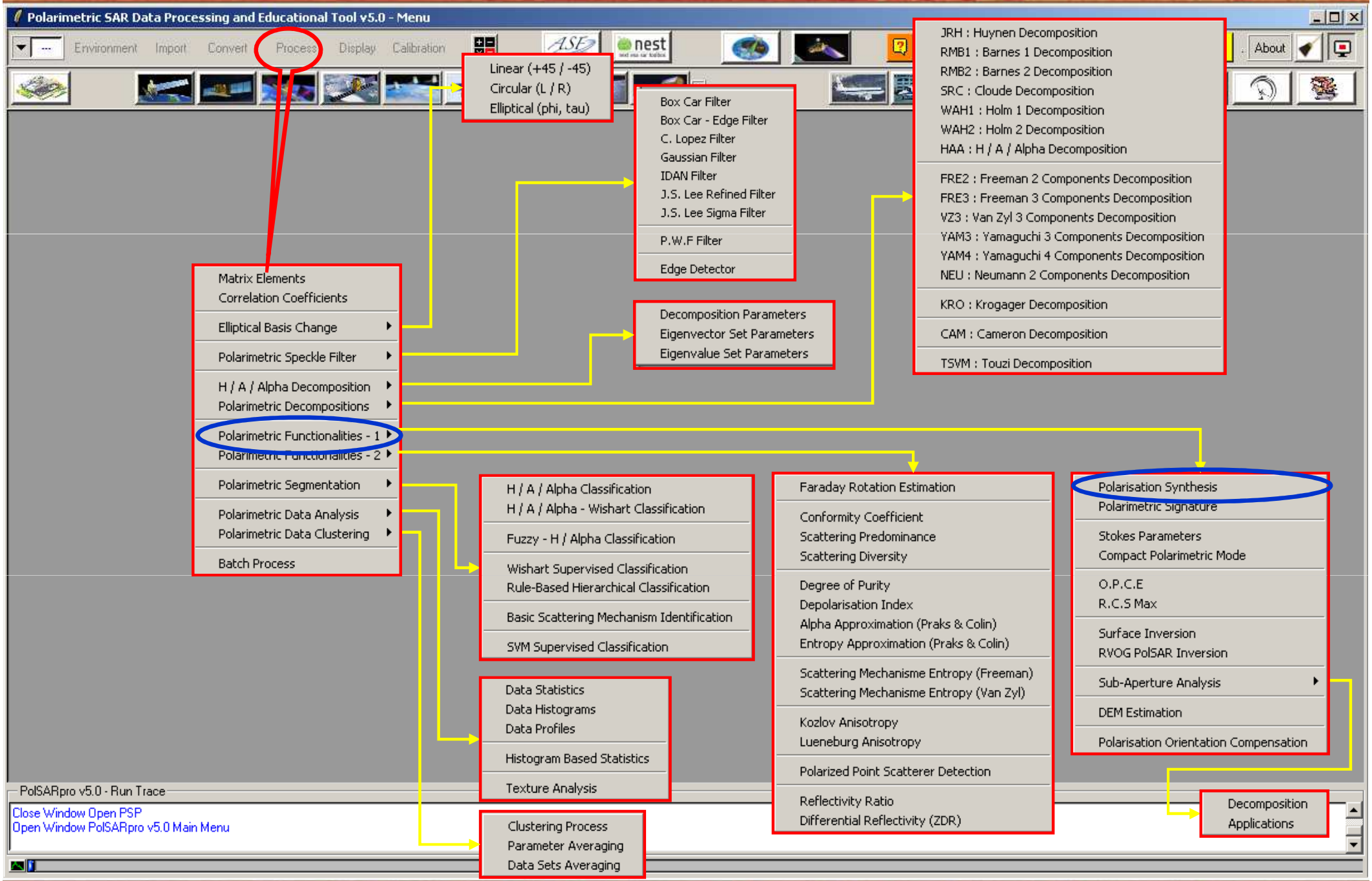
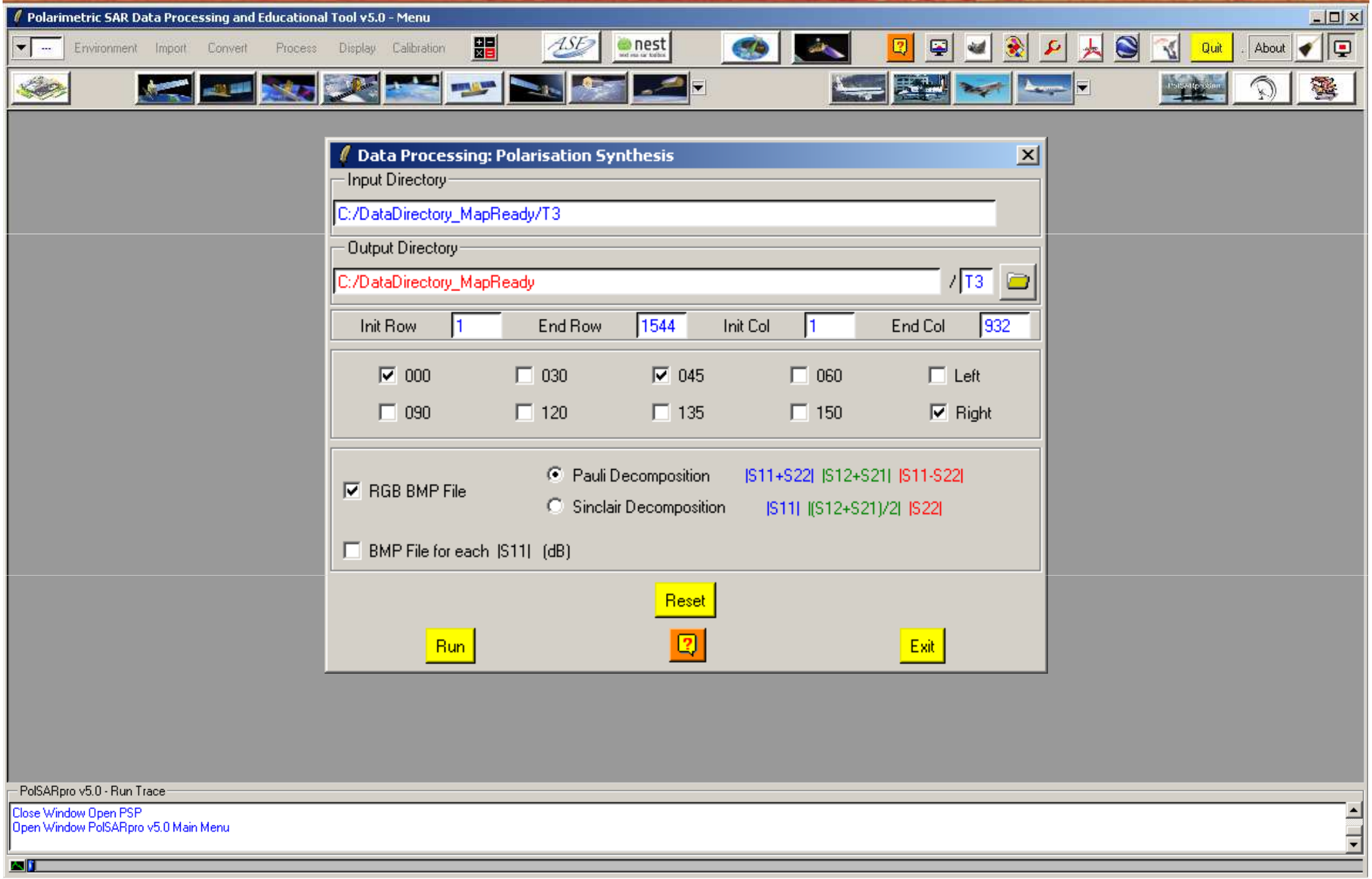
PROCESS DATA



POLARIZATION SYNTHESIS



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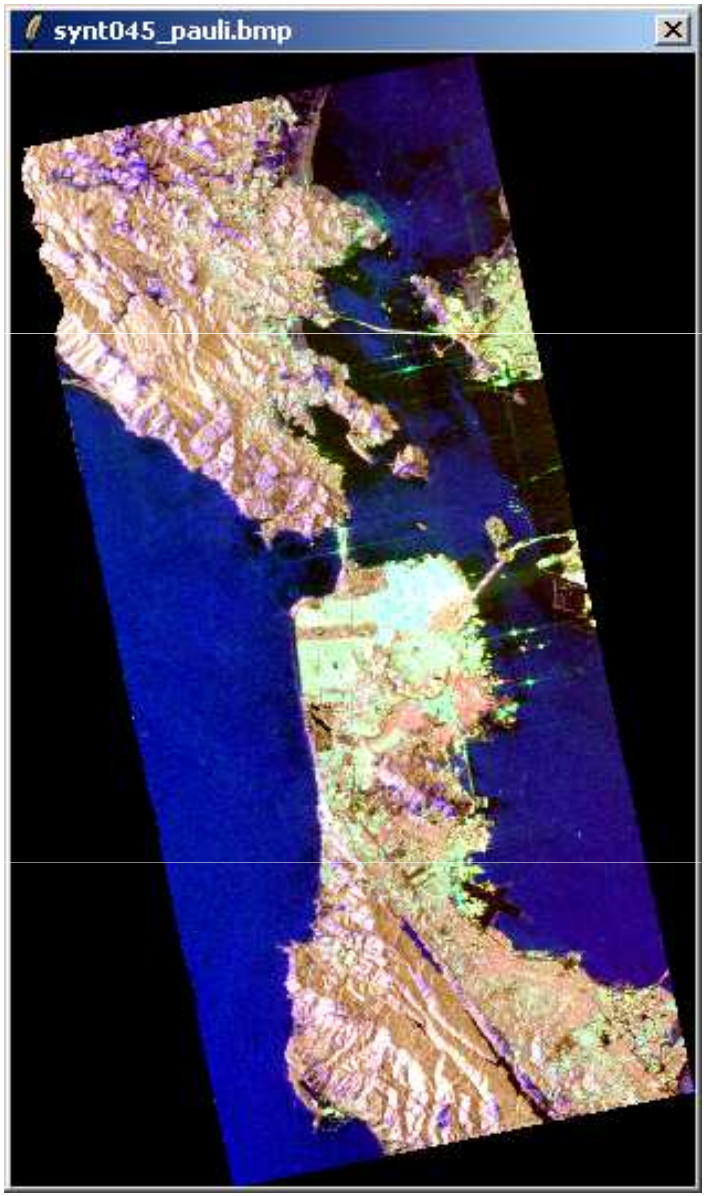

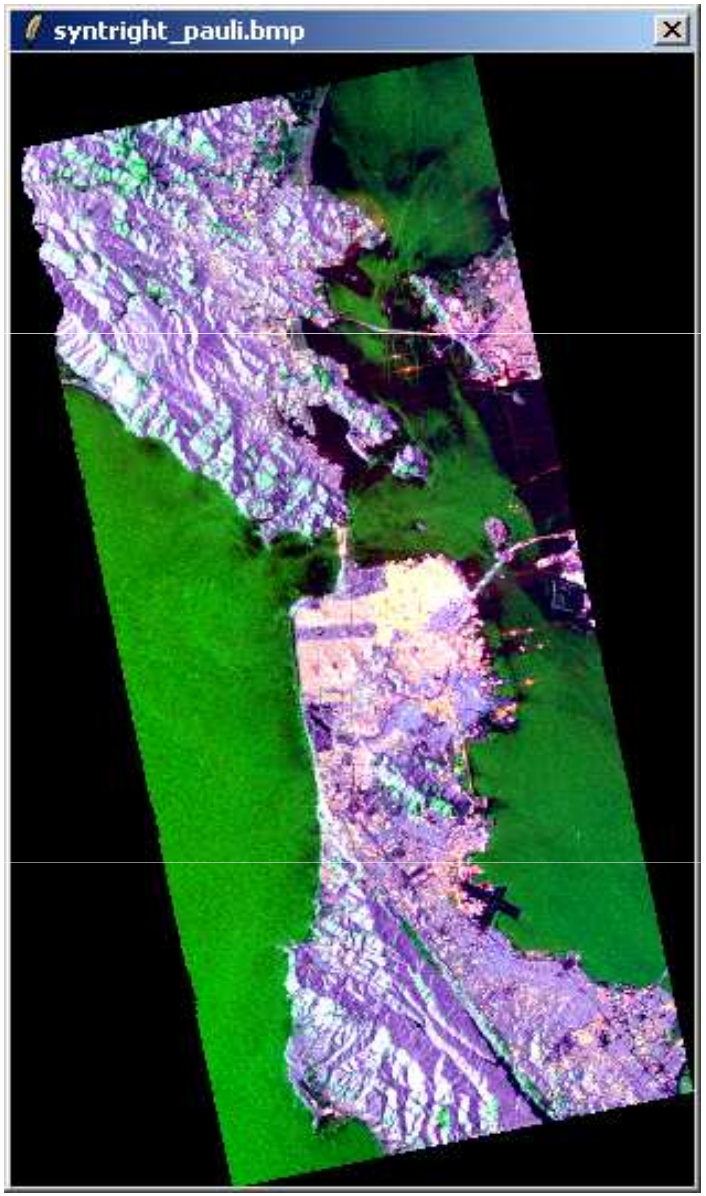

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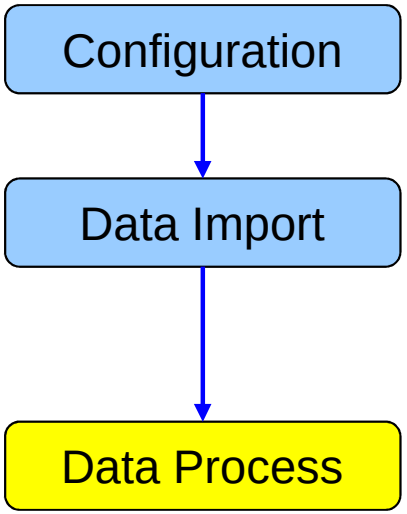

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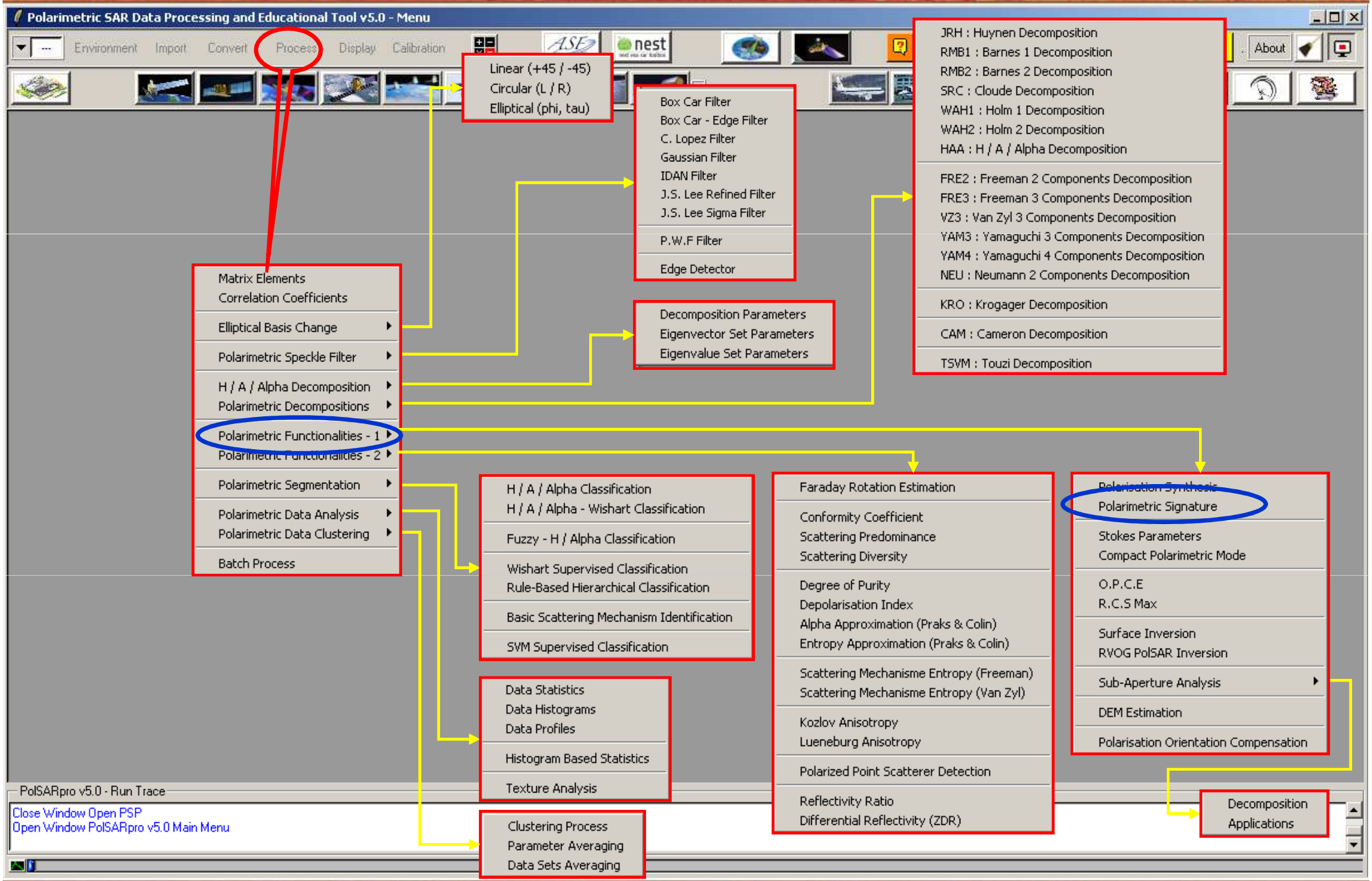
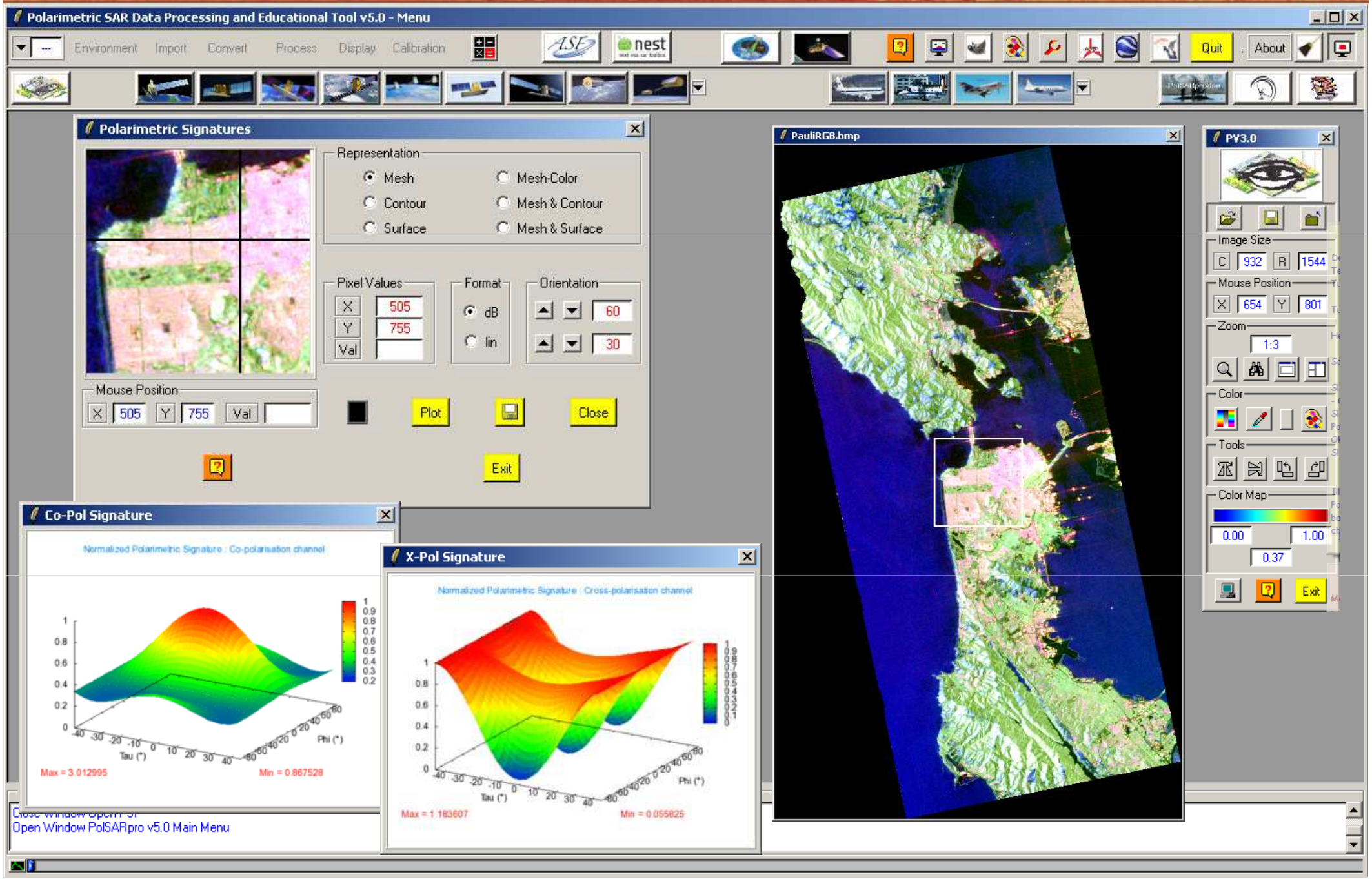


POLARIMETRIC SIGNATURES



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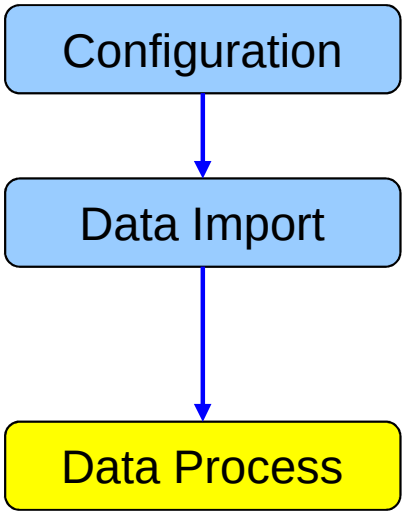

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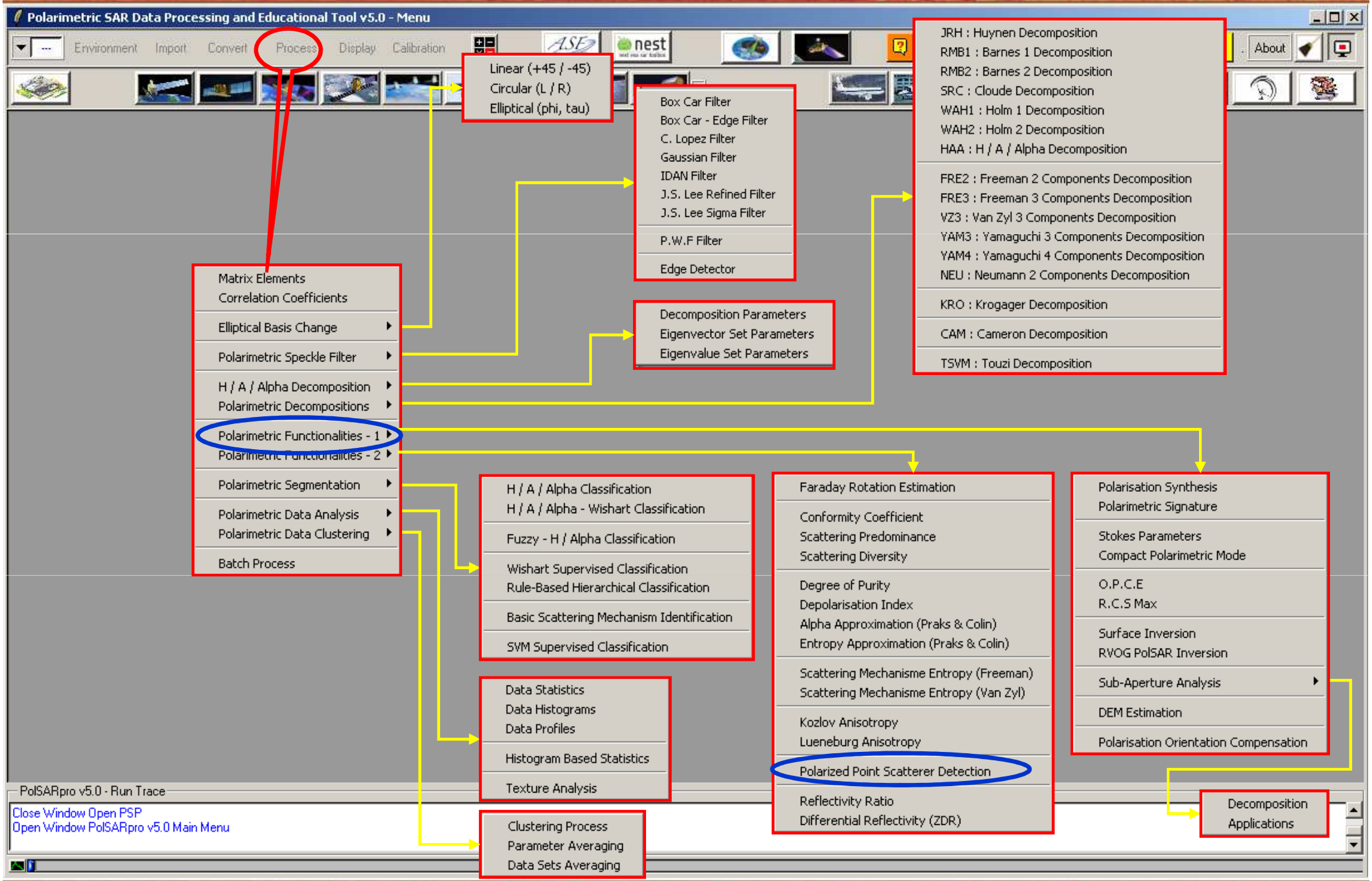
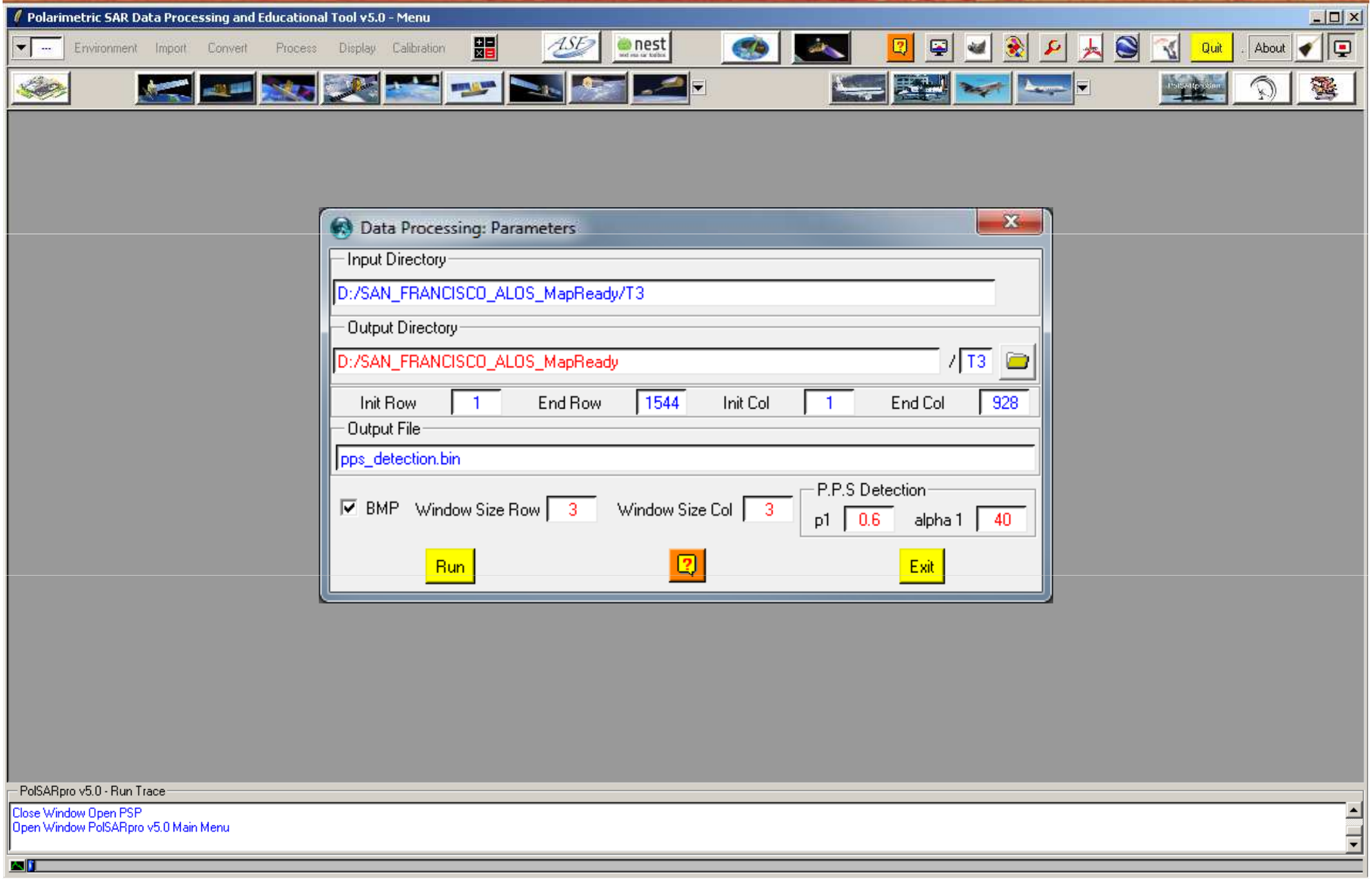


POLARIZED POINT SCATTERER DETECTION



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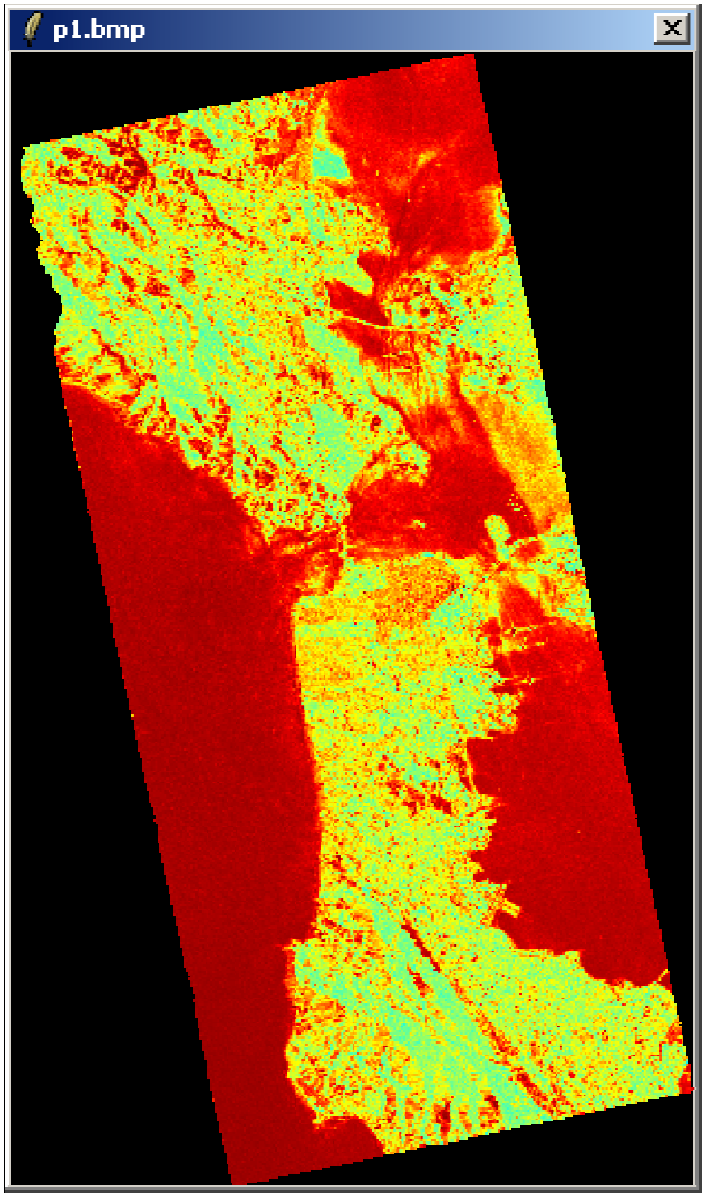
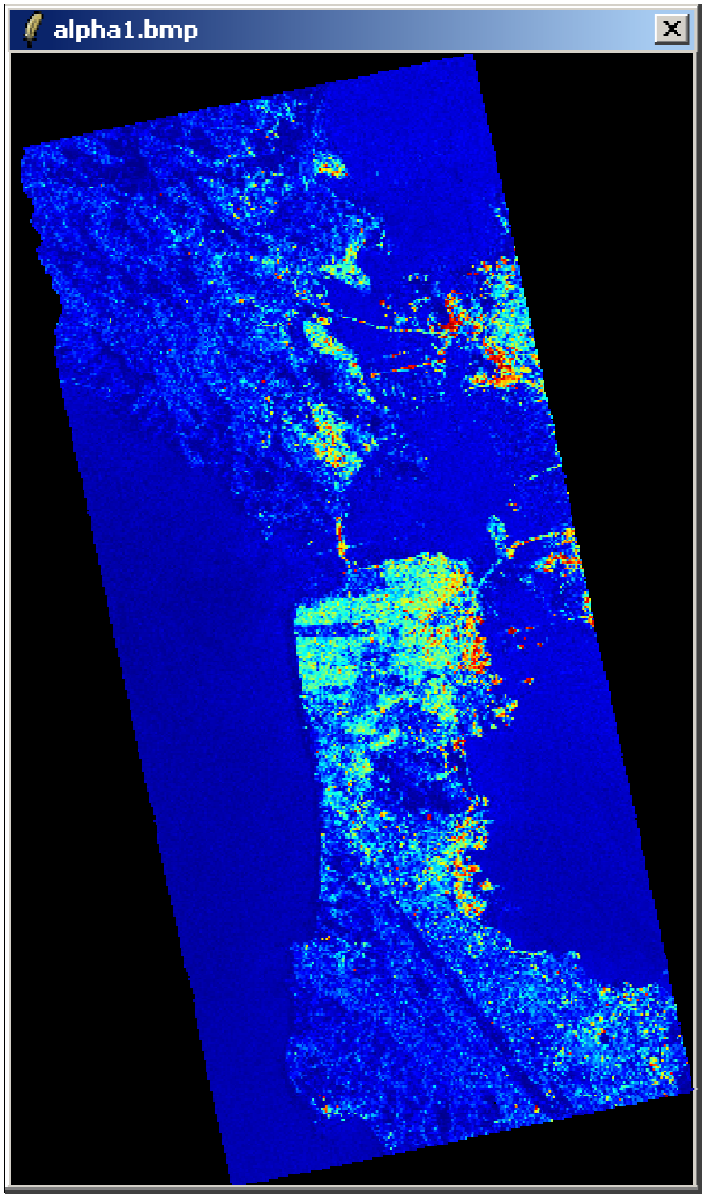
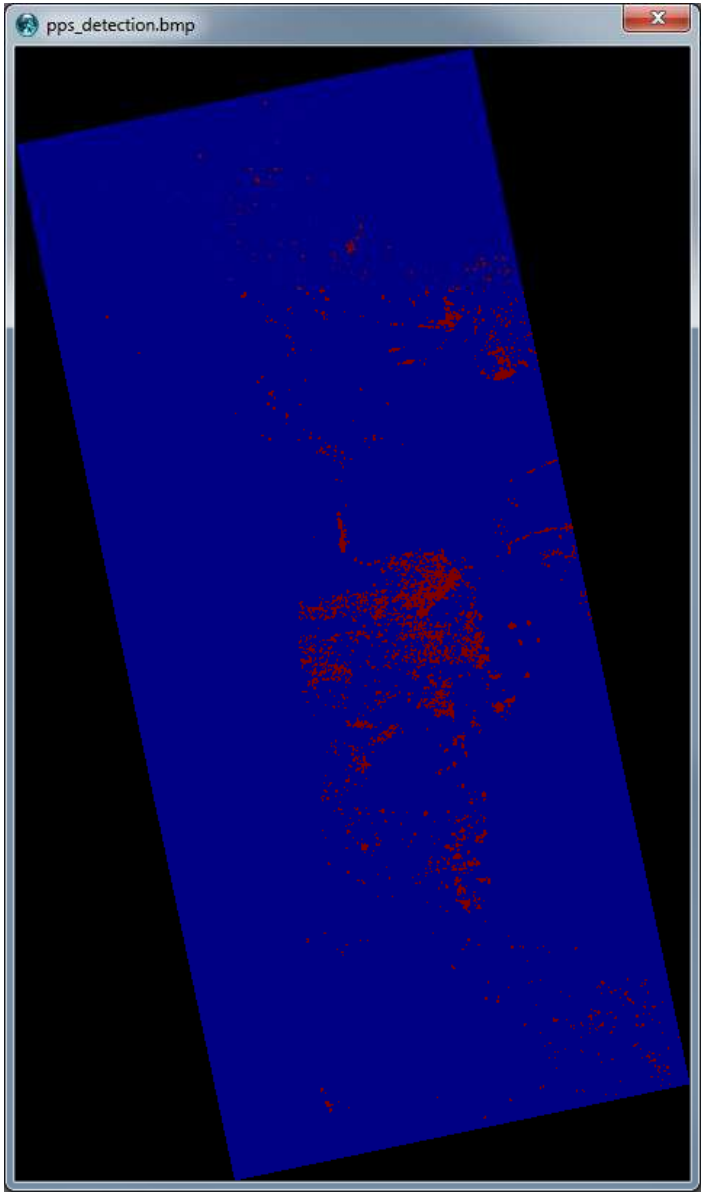
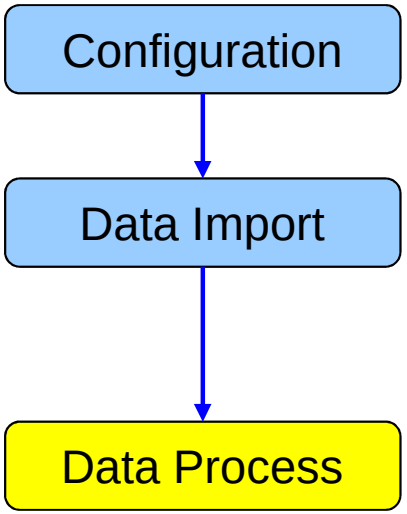






PROCESSING CHAIN



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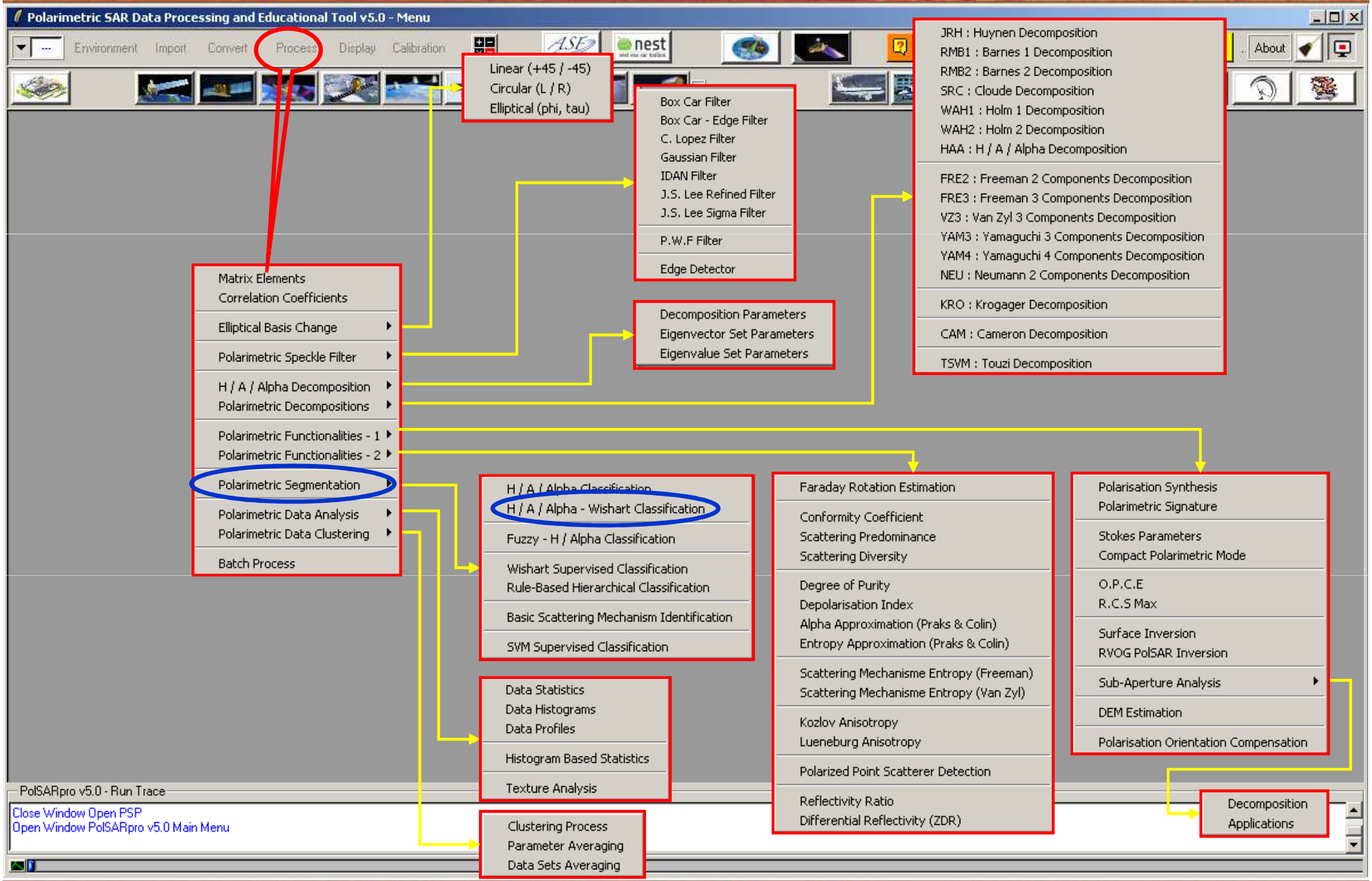
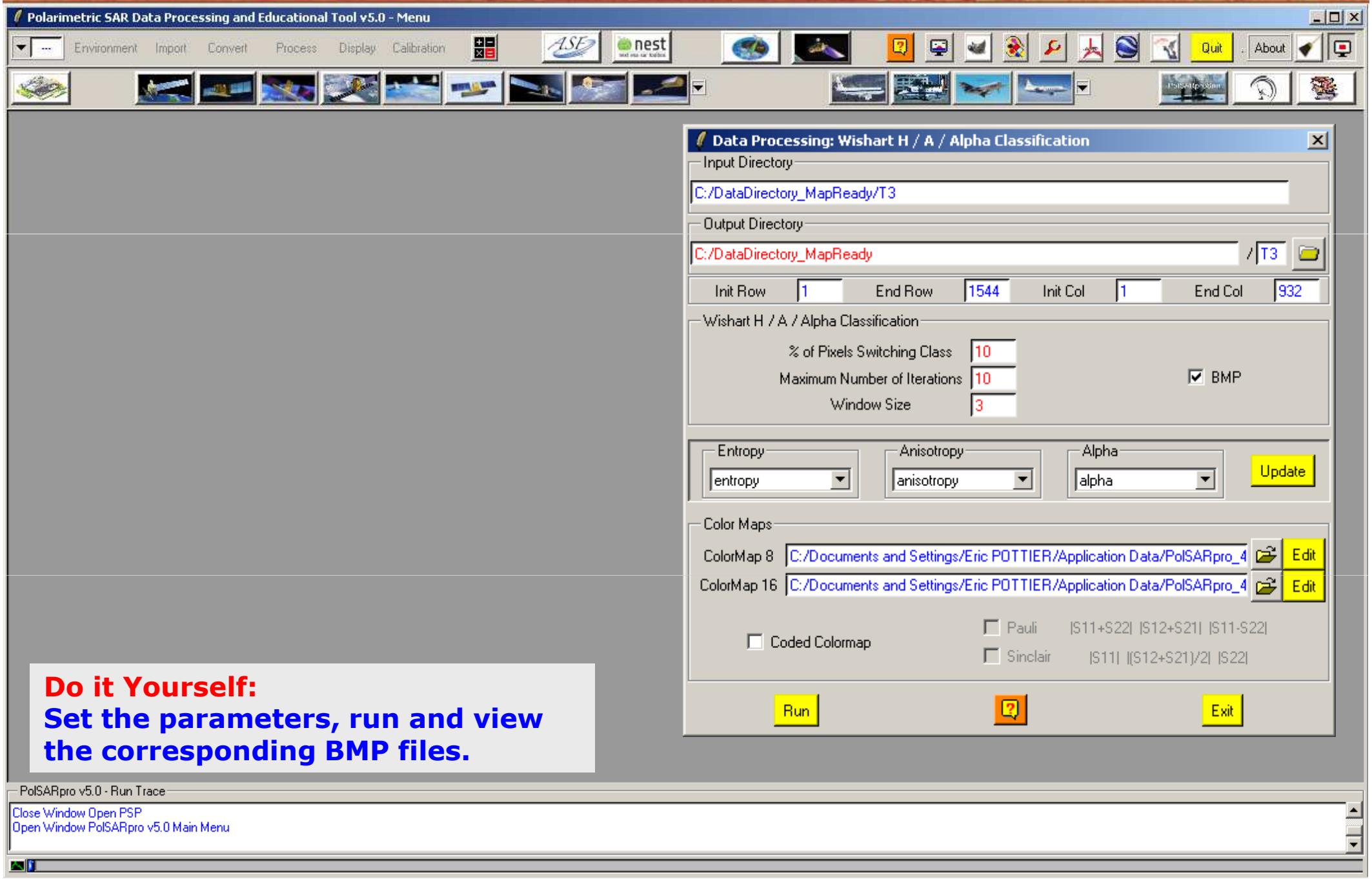
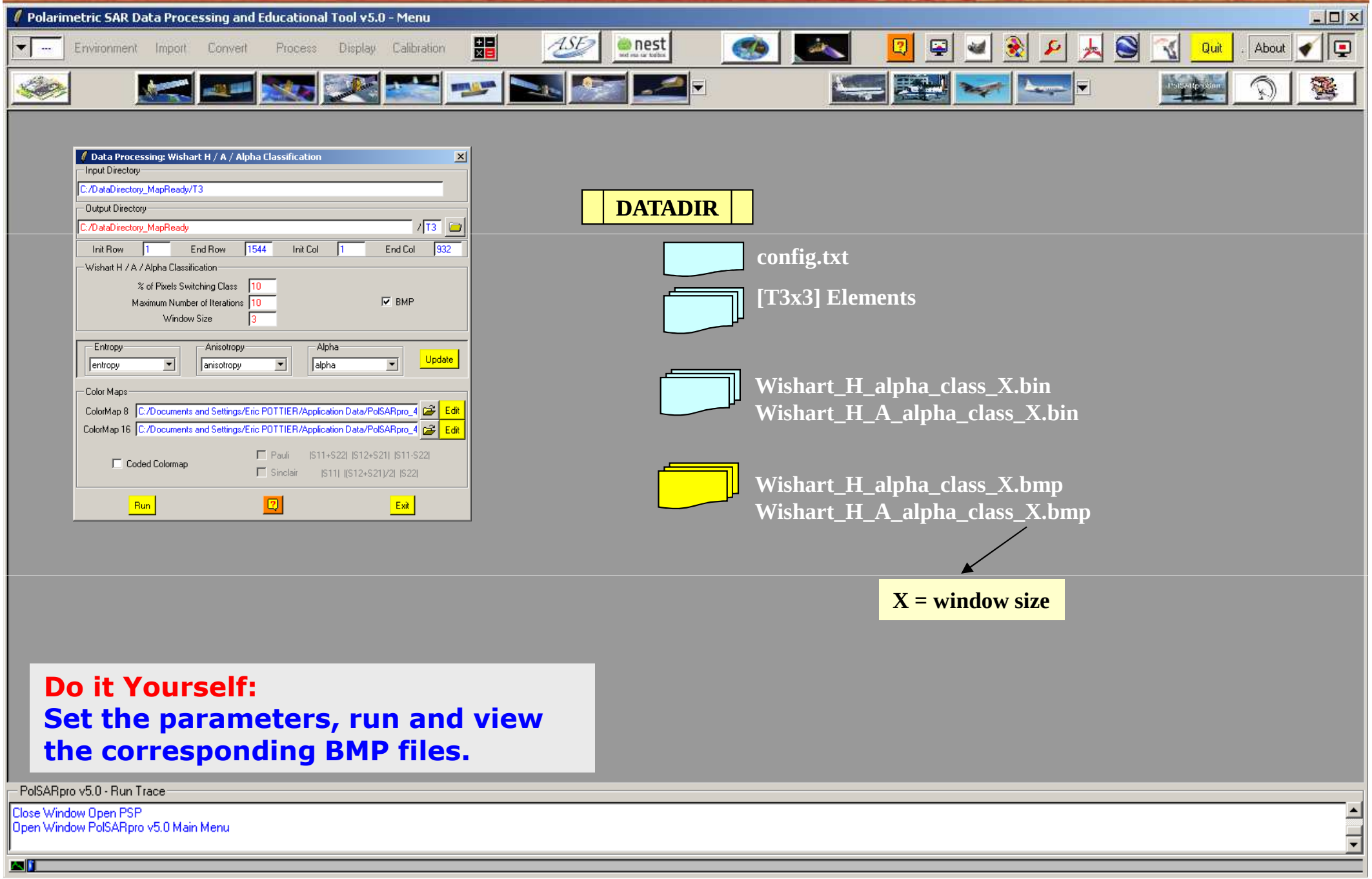


WISHART - H/A/alpha CLASSIFICATION

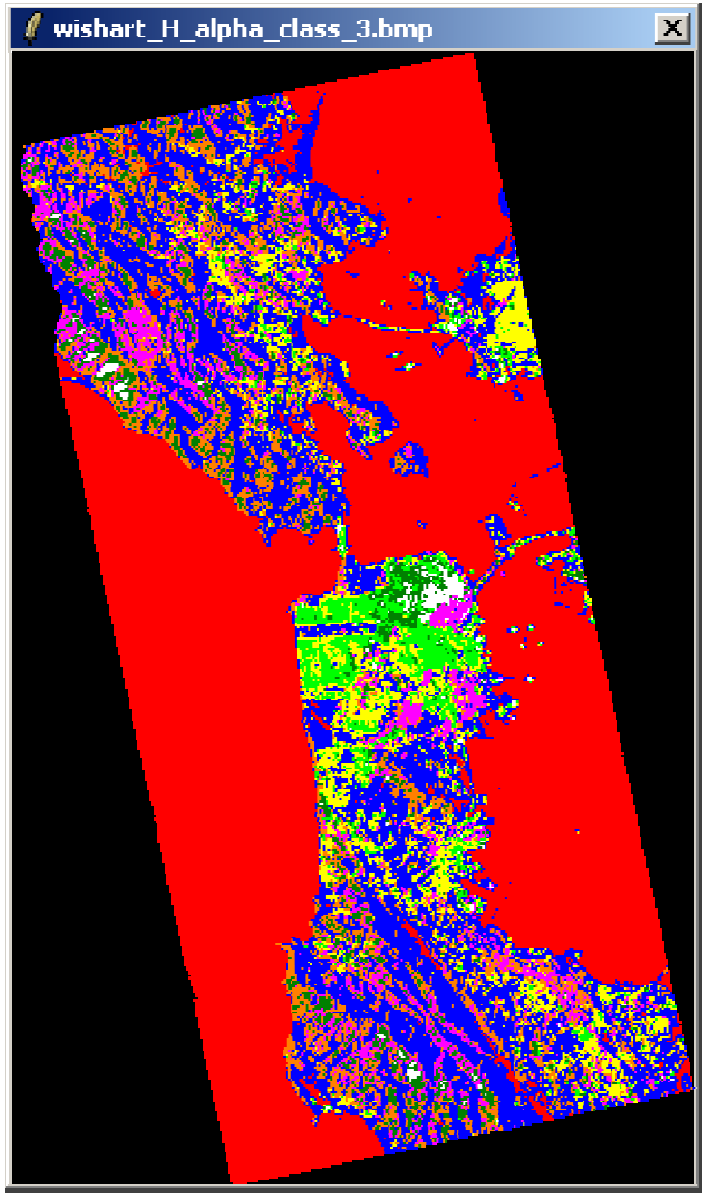


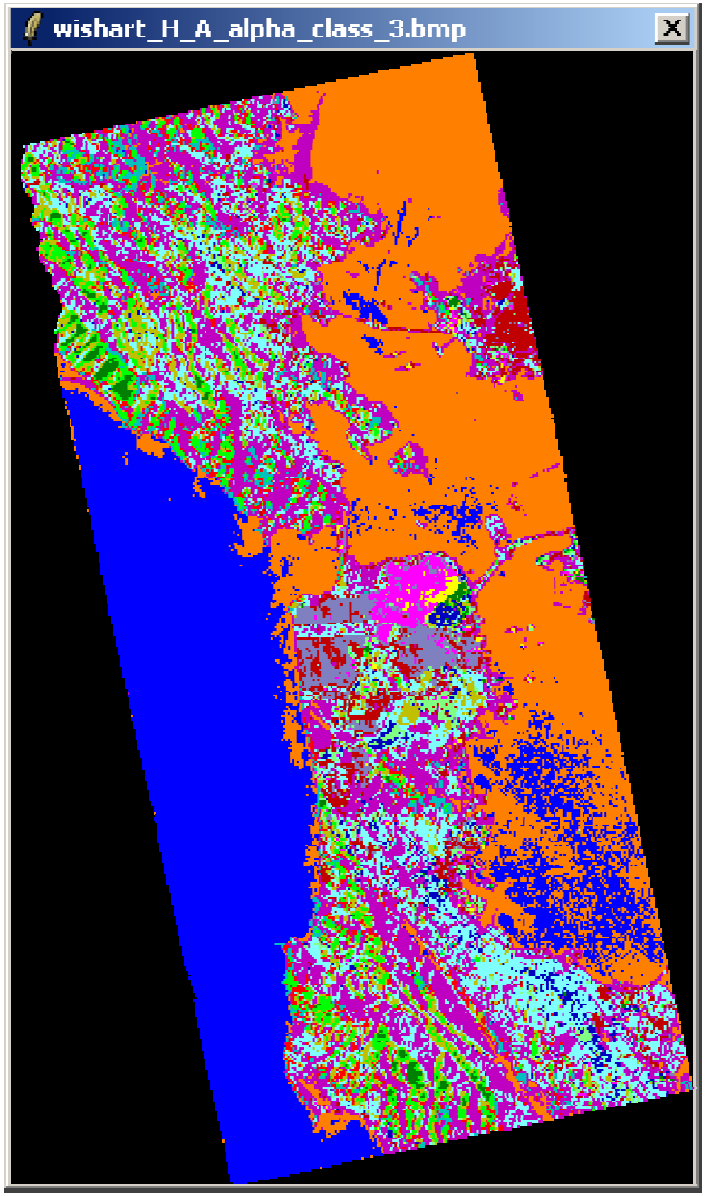
Do it Yourself:
Set the parameters, run and view the corresponding BMP files.

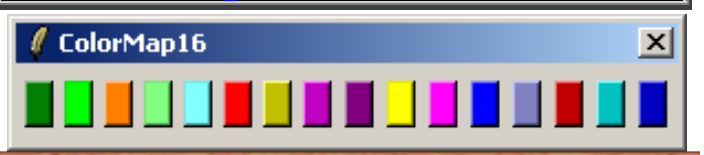
WISHART - H/A/alpha CLASSIFICATION



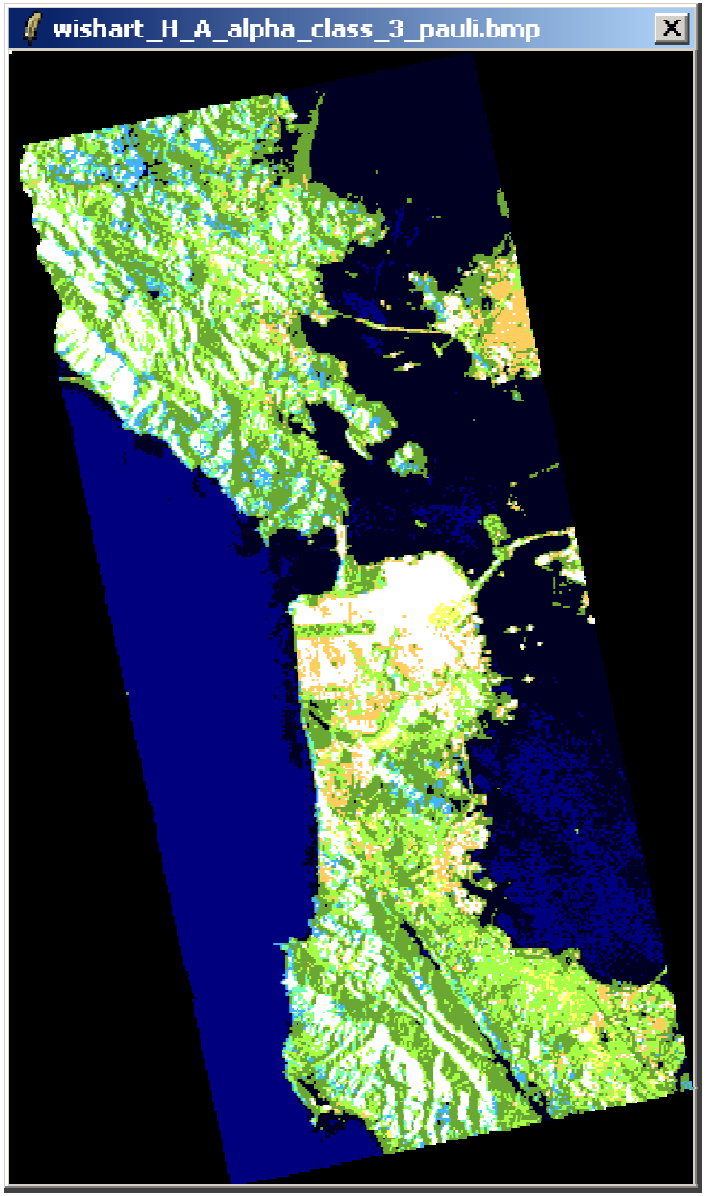
WISHART - H/A/alpha CLASSIFICATION



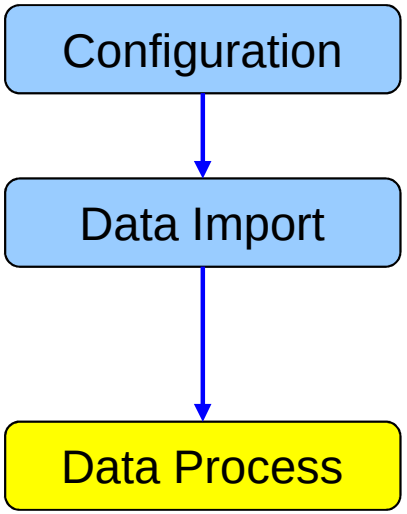




WISHART - H/A/alpha CLASSIFICATION



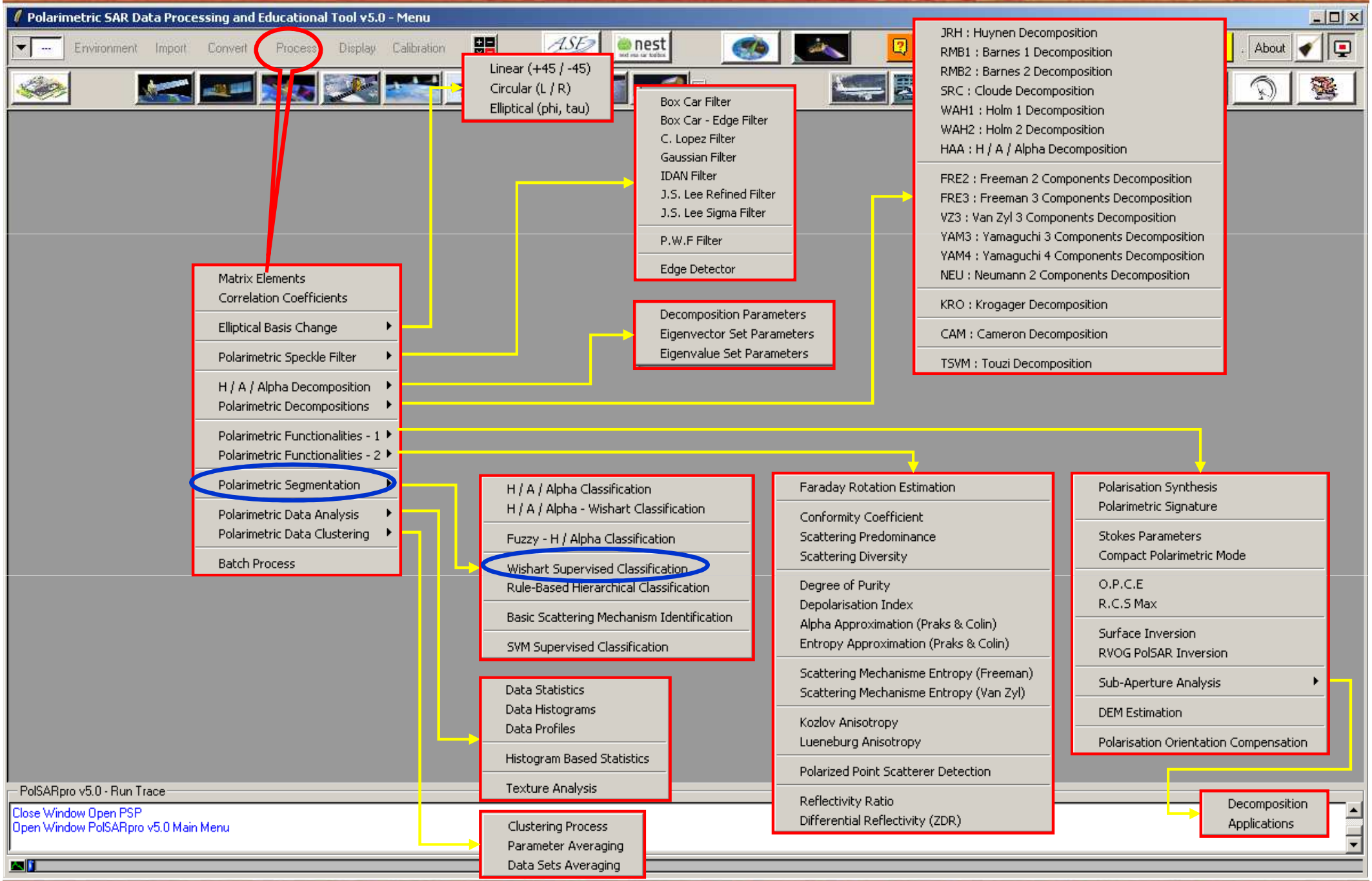
PROCESSING CHAIN



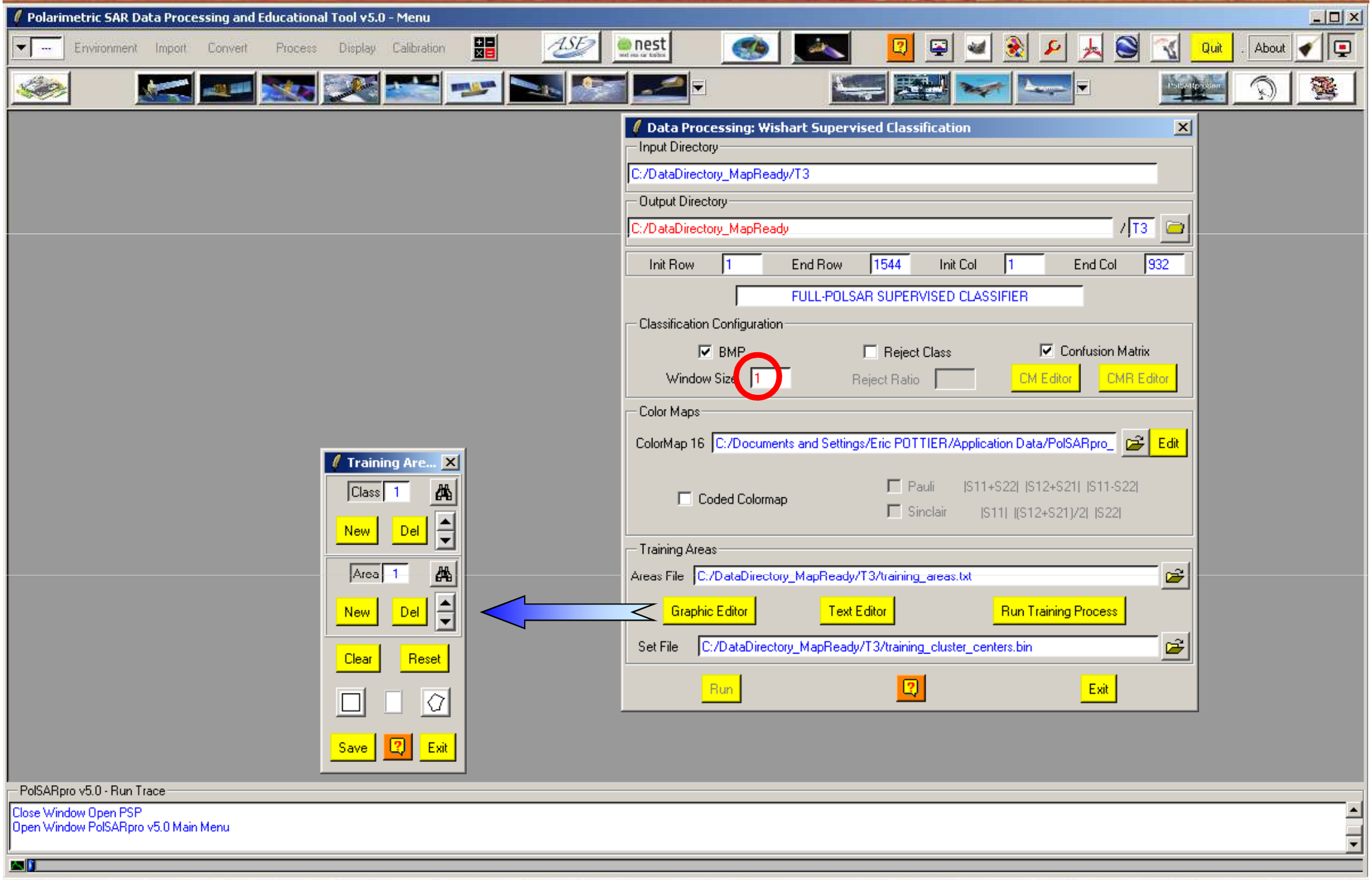
- Input Data File:
  - Spaceborne Sensors
- Extract Raw Data

- Eigenvalue Parameters
- Polarimetric Decomposition
  - Freeman
  - Van Zyl
- Polarimetric Functionalities
  - Polarimetric Synthesis
  - Polarimetric Signatures
  - Polarized Point Scatterer Detection
- Polarimetric Segmentation
  - Wishart - H / A / alpha classification
  - Supervised Wishart classification
  - Support Vector Machine Classification

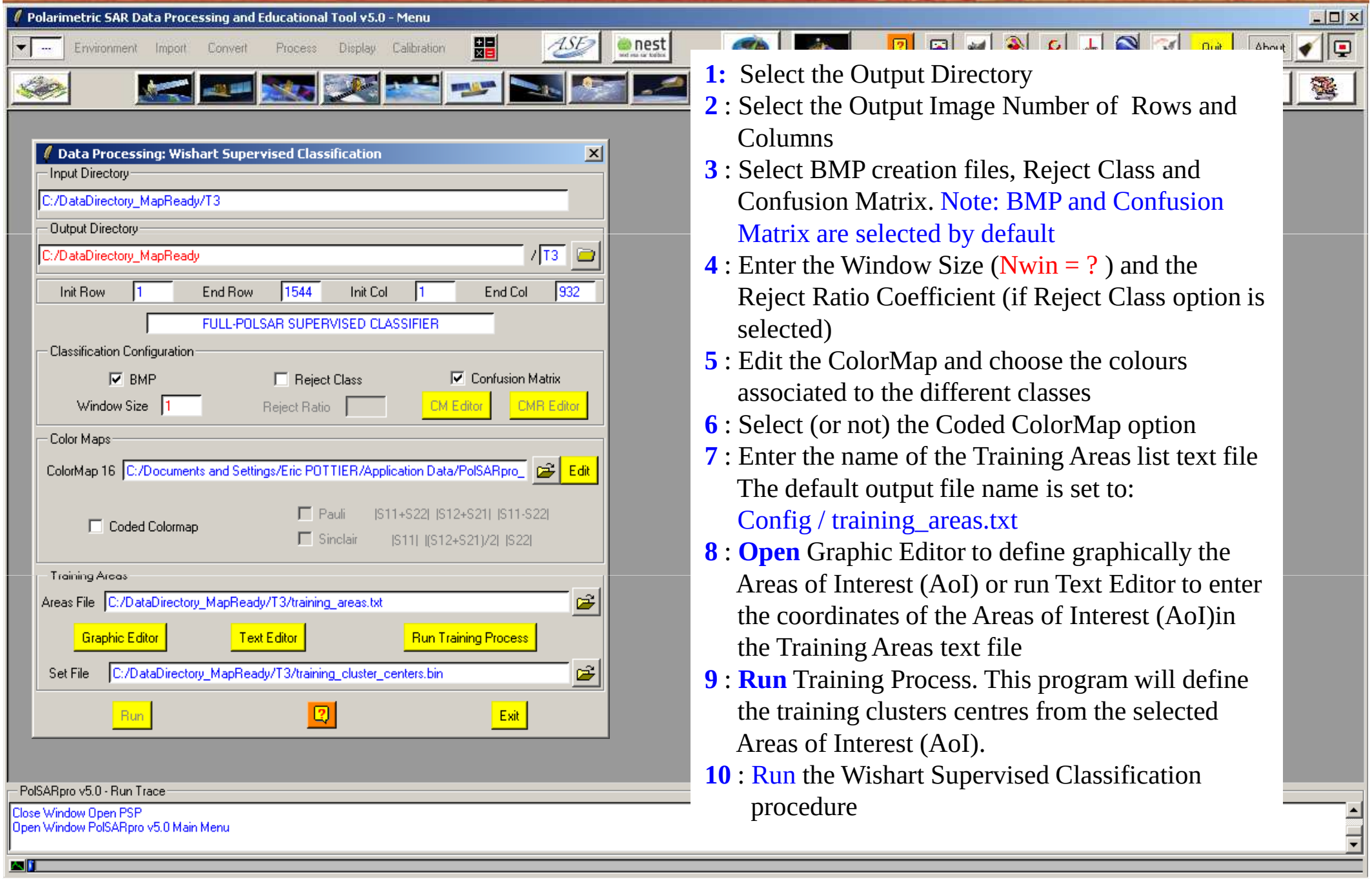
PROCESS DATA



SUPERVISED CLASSIFICATION



SUPERVISED CLASSIFICATION



1: Select the Output Directory

2 : Select the Output Image Number of Rows and Columns

3 : Select BMP creation files, Reject Class and Confusion Matrix. Note: BMP and Confusion Matrix are selected by default

4 : Enter the Window Size (Nwin = ?) and the Reject Ratio Coefficient (if Reject Class option is selected)

5 : Edit the ColorMap and choose the colours associated to the different classes

6 : Select (or not) the Coded ColorMap option

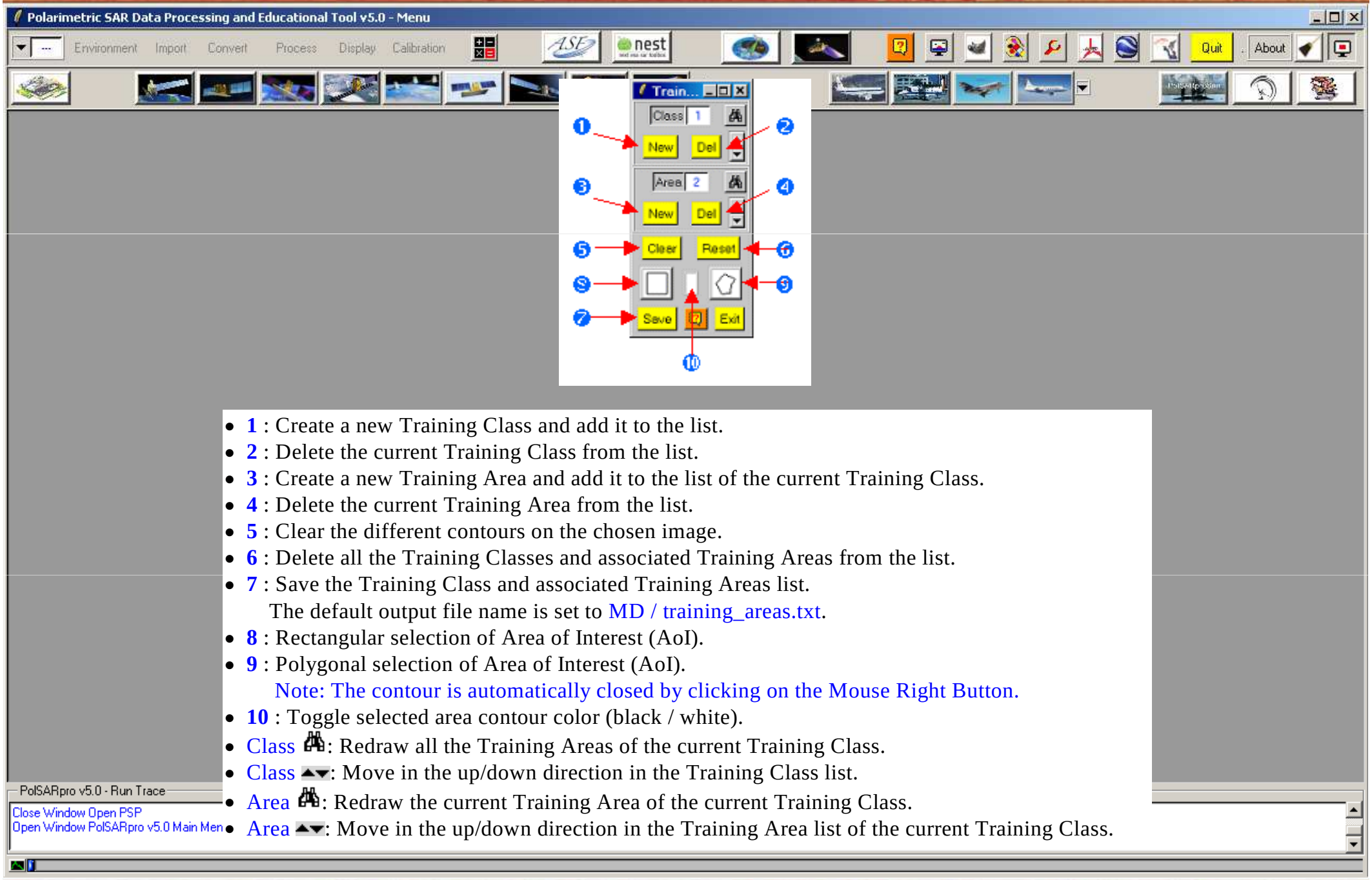
7 : Enter the name of the Training Areas list text file The default output file name is set to: Config / training_areas.txt

8 : **Open** Graphic Editor to define graphically the Areas of Interest (AoI) or run Text Editor to enter the coordinates of the Areas of Interest (AoI)in the Training Areas text file

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

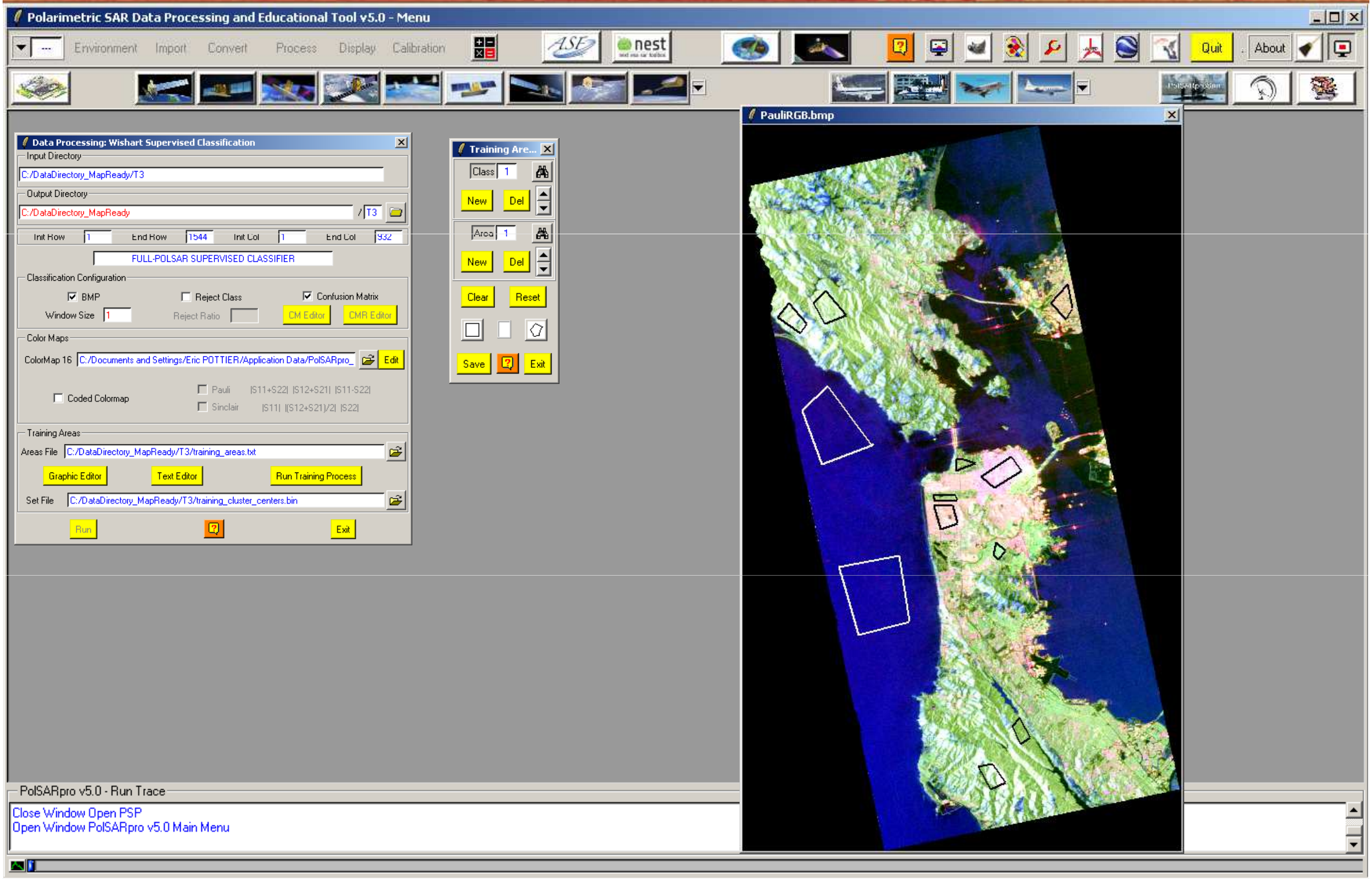
10 : Run the Wishart Supervised Classification procedure

SUPERVISED CLASSIFICATION

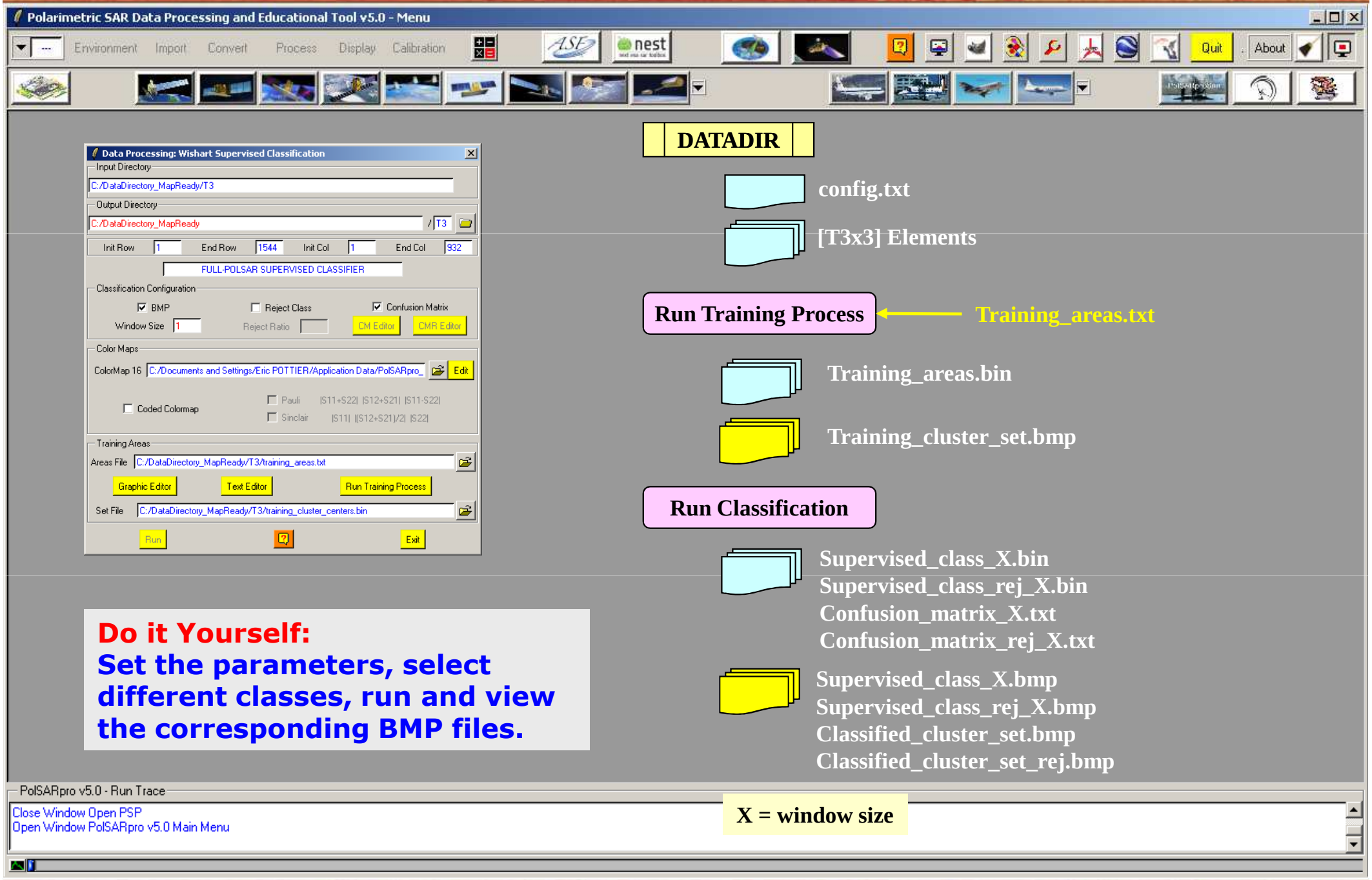


- **1** : Create a new Training Class and add it to the list.
- **2** : Delete the current Training Class from the list.
- **3** : Create a new Training Area and add it to the list of the current Training Class.
- **4** : Delete the current Training Area from the list.
- **5** : Clear the different contours on the chosen image.
- **6** : Delete all the Training Classes and associated Training Areas from the list.
- **7** : Save the Training Class and associated Training Areas list.
  The default output file name is set to MD / training_areas.txt.
- **8** : Rectangular selection of Area of Interest (AoI).
- **9** : Polygonal selection of Area of Interest (AoI).
  Note: The contour is automatically closed by clicking on the Mouse Right Button.
- **10** : Toggle selected area contour color (black / white).
- Class : Redraw all the Training Areas of the current Training Class.
- Class : Move in the up/down direction in the Training Class list.
- Area : Redraw the current Training Area of the current Training Class.
- Area : Move in the up/down direction in the Training Area list of the current Training Class.

SUPERVISED CLASSIFICATION



SUPERVISED CLASSIFICATION



DATADIR

config.txt

[T3x3] Elements

Run Training Process ← Training_areas.txt

Training_areas.bin

Training_cluster_set.bmp

Run Classification

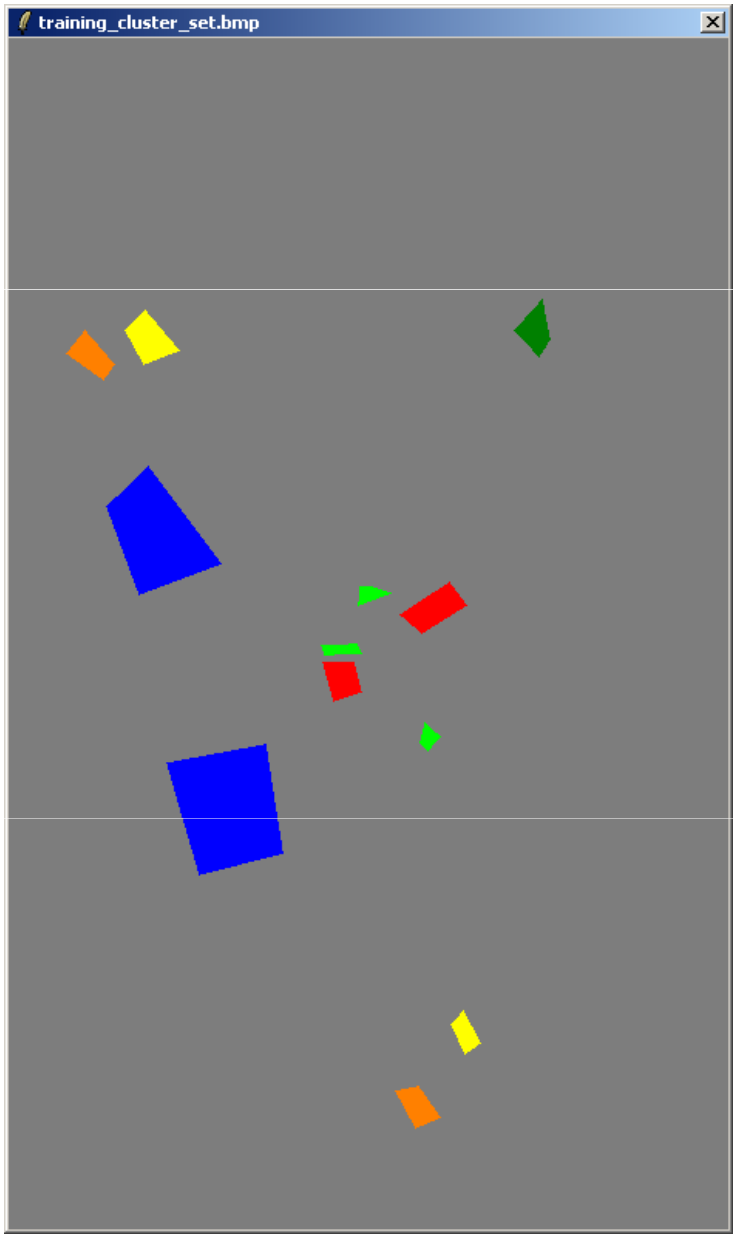
Supervised_class_X.bin
Supervised_class_rej_X.bin
Confusion_matrix_X.txt
Confusion_matrix_rej_X.txt

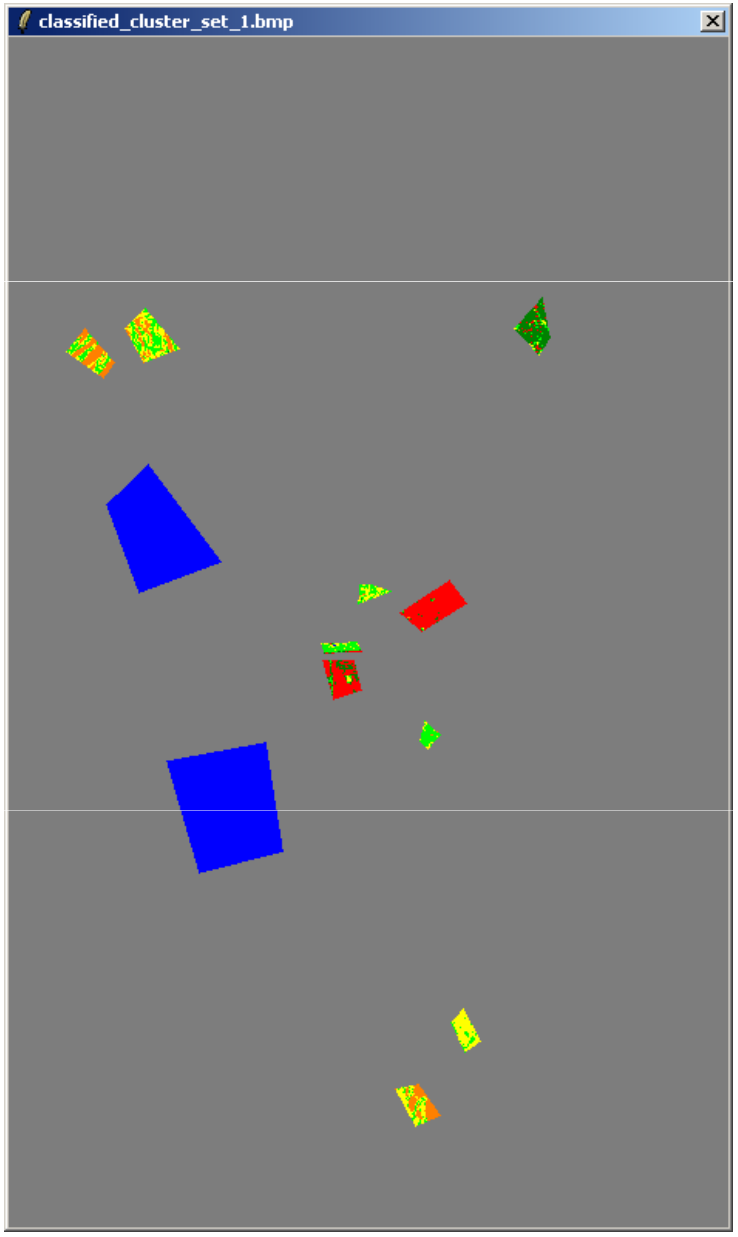
Supervised_class_X.bmp
Supervised_class_rej_X.bmp
Classified_cluster_set.bmp
Classified_cluster_set_rej.bmp

Do it Yourself:
Set the parameters, select different classes, run and view the corresponding BMP files.

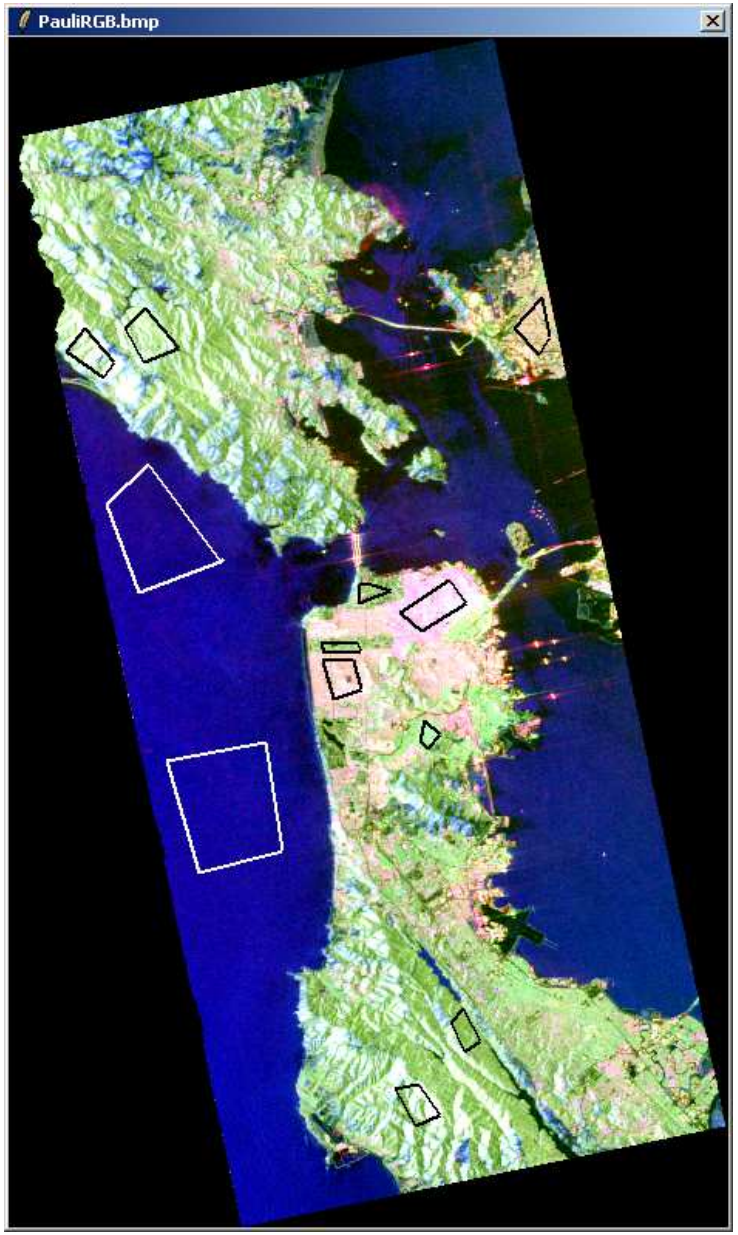
X = window size

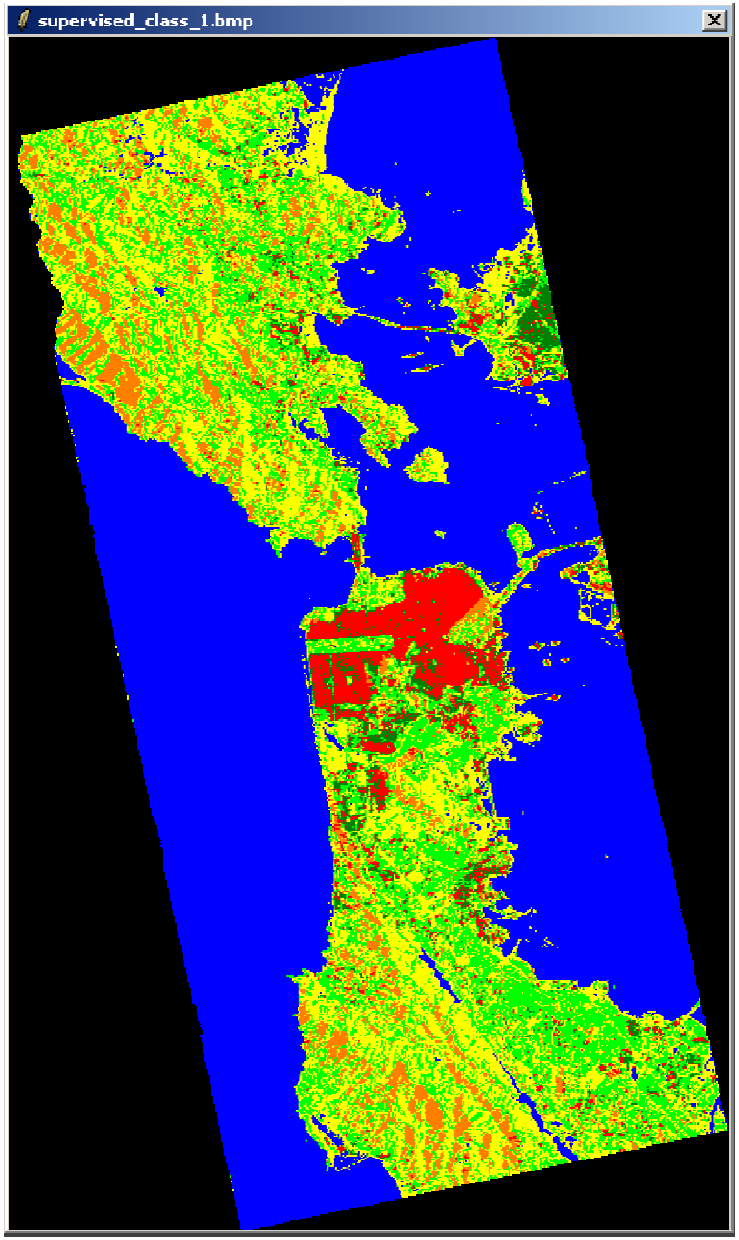
SUPERVISED CLASSIFICATION



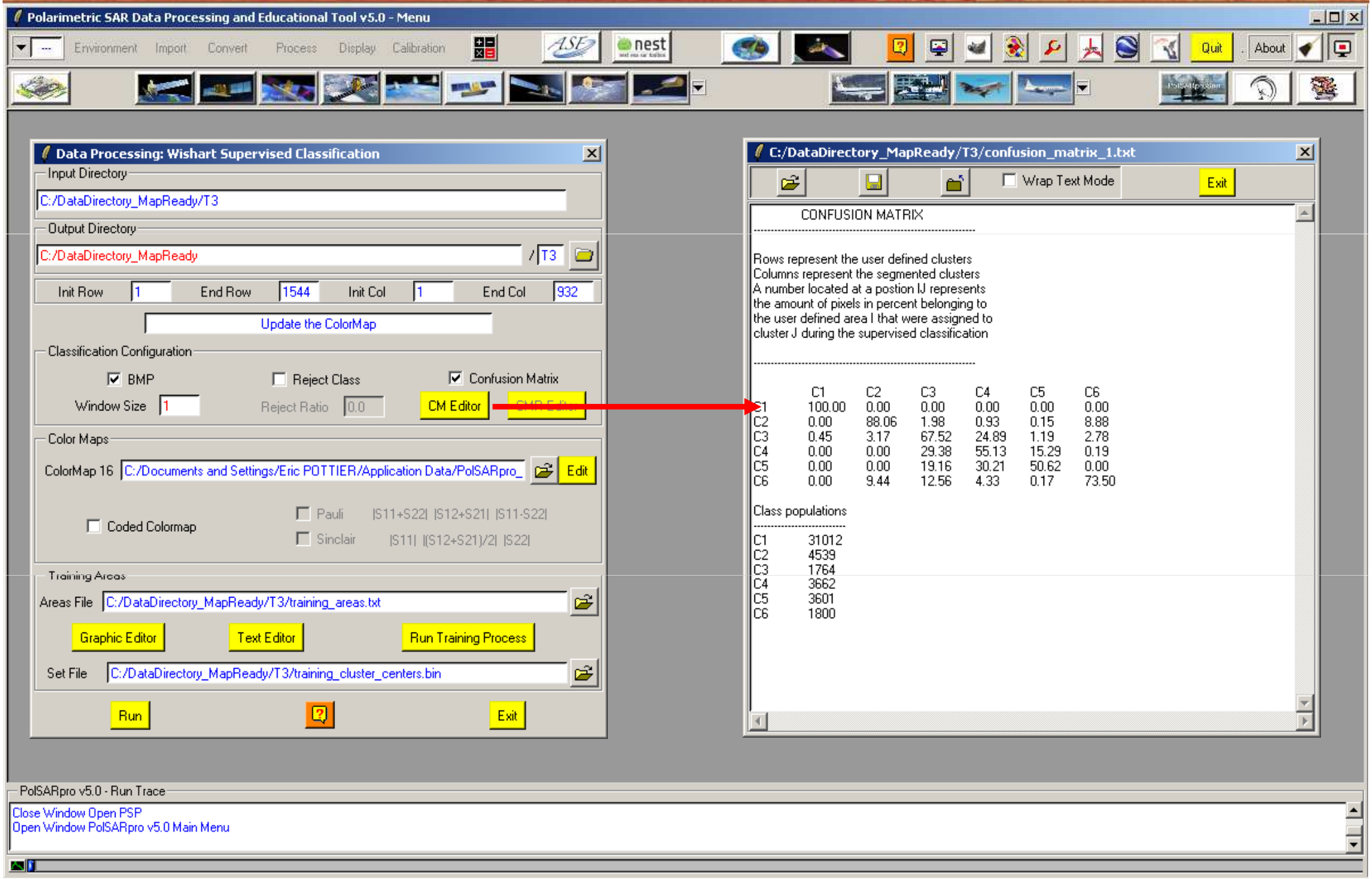


SUPERVISED CLASSIFICATION

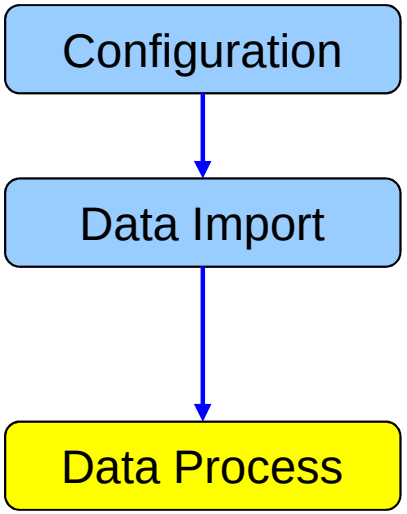




SUPERVISED CLASSIFICATION



PROCESSING CHAIN



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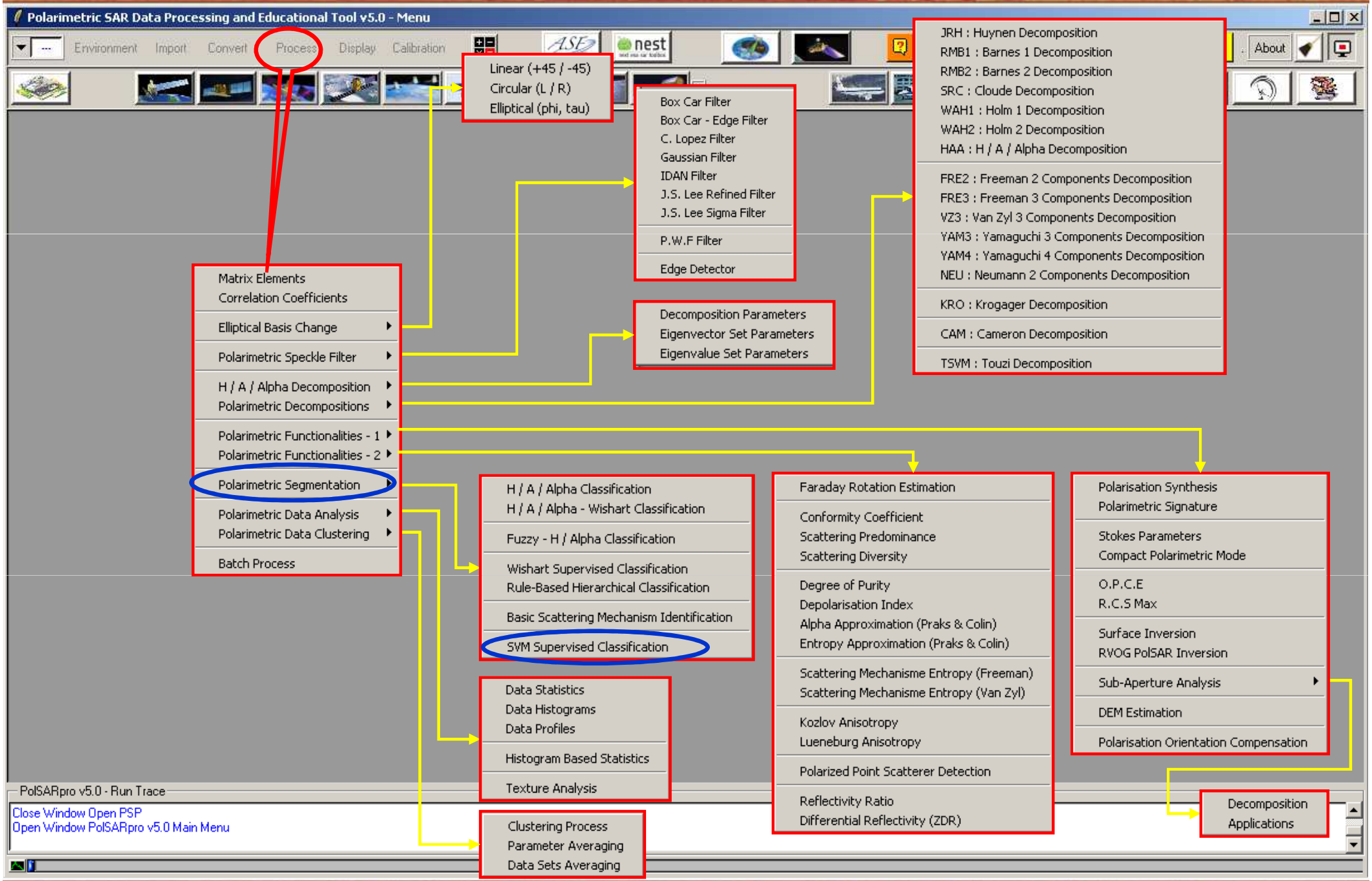
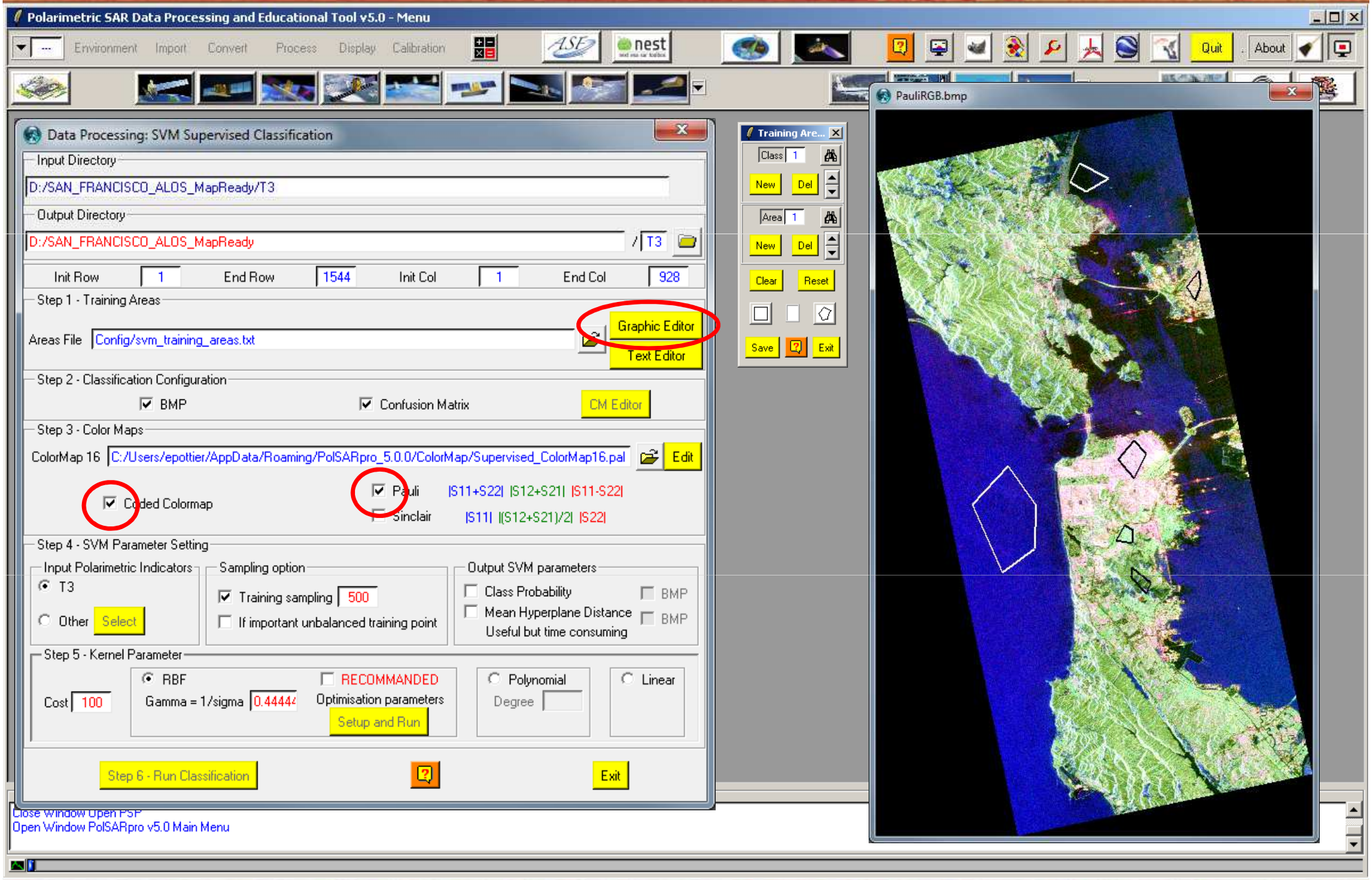
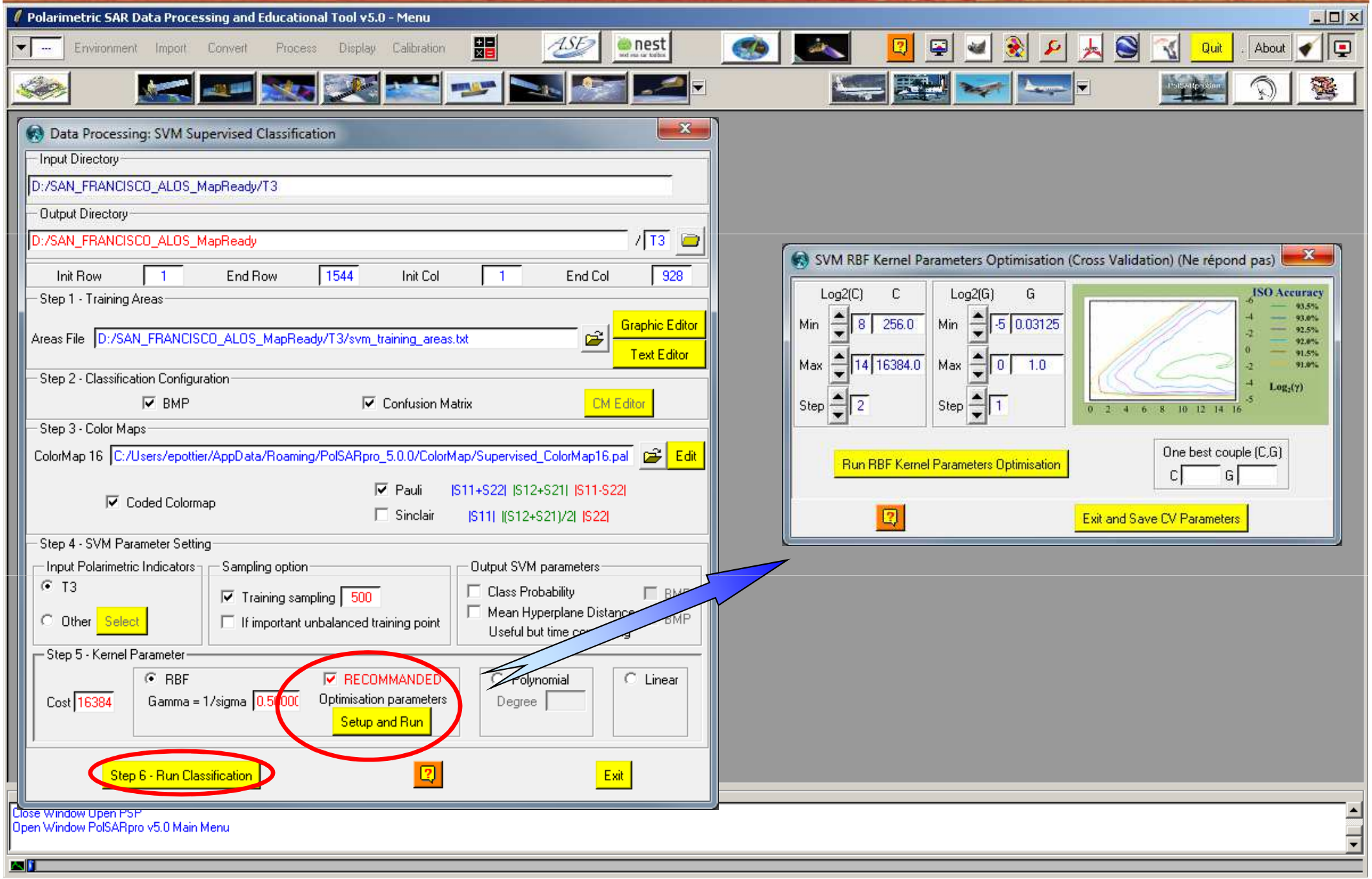
PROCESS DATA



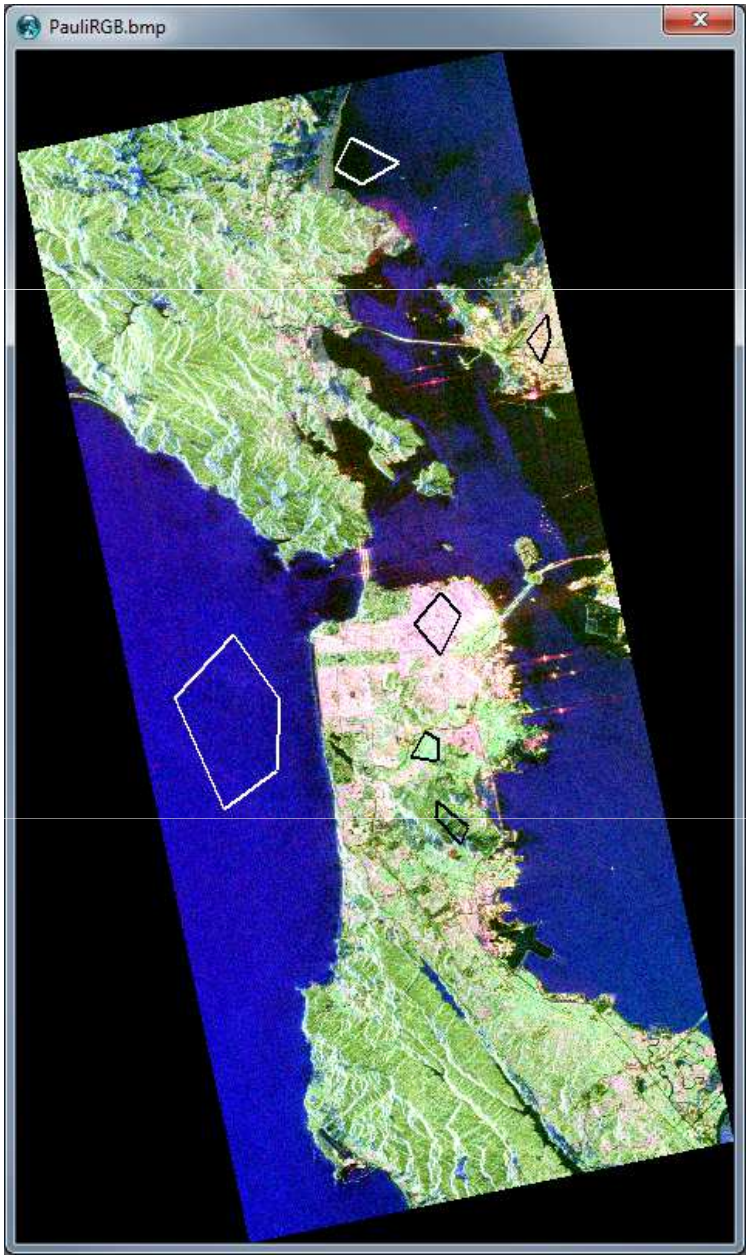
SUPPORT VECTOR MACHINE CLASSIFICATION

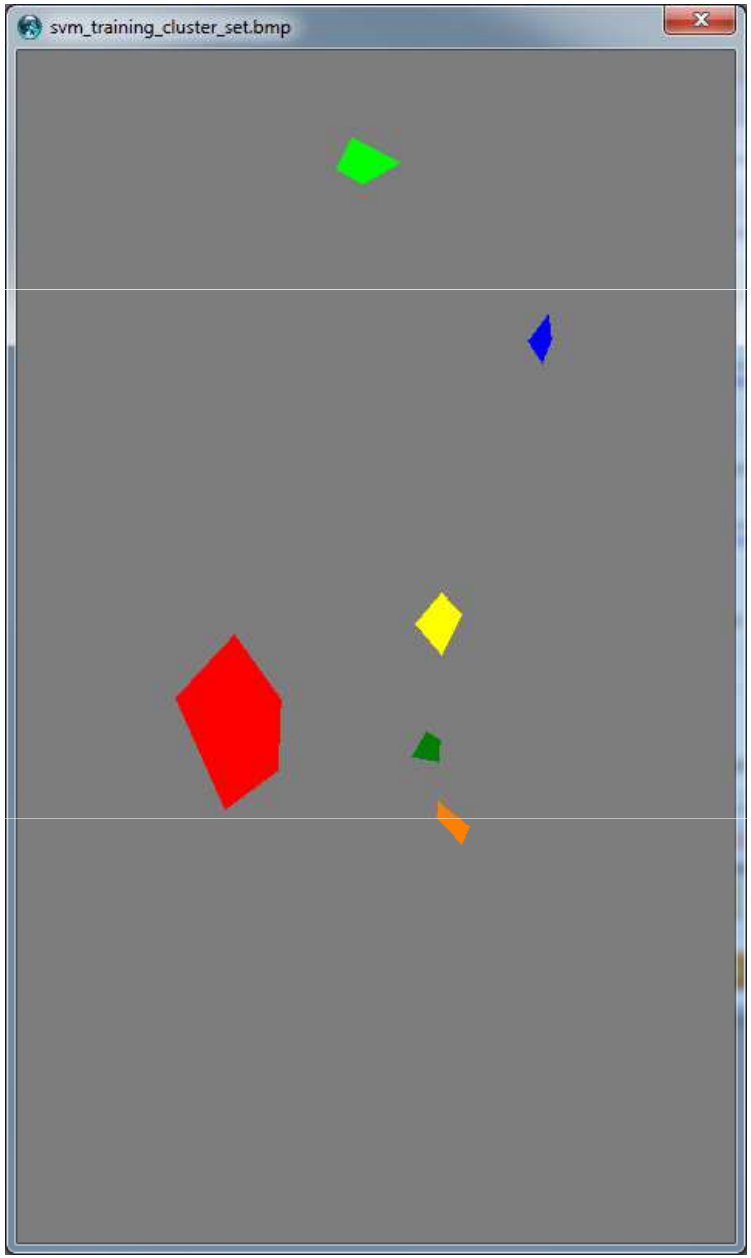


SUPPORT VECTOR MACHINE CLASSIFICATION

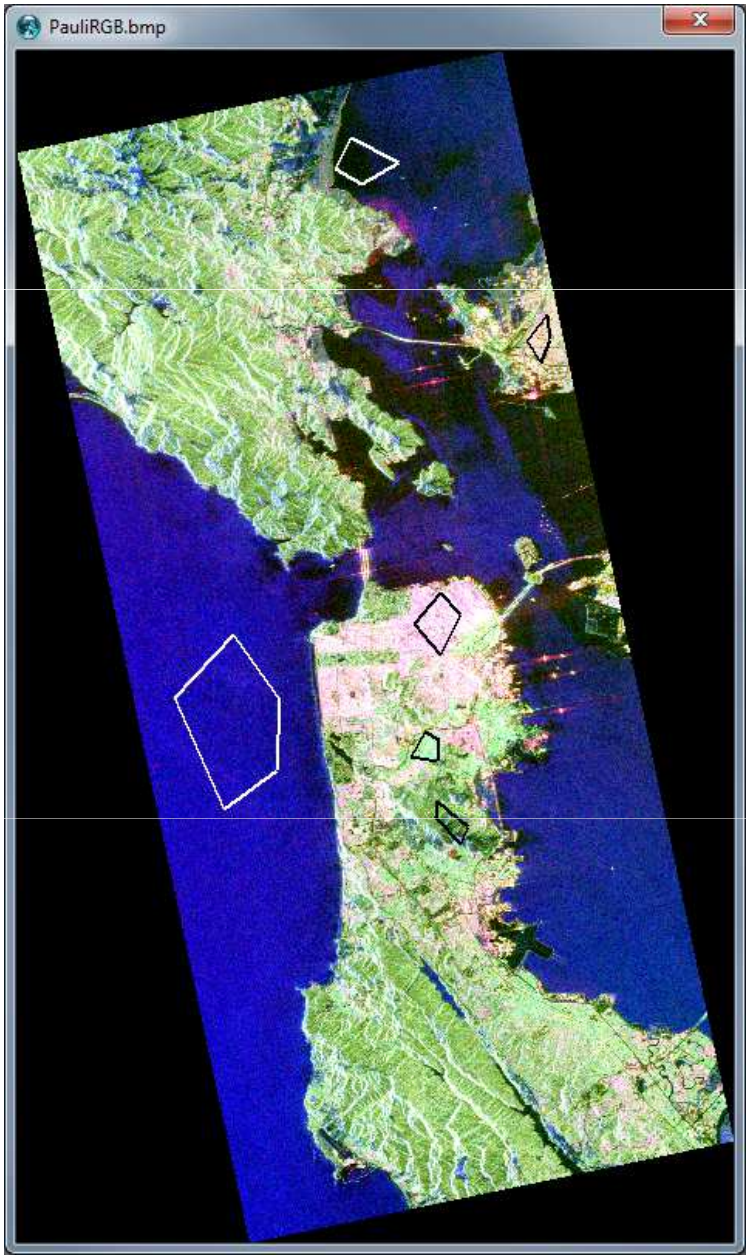


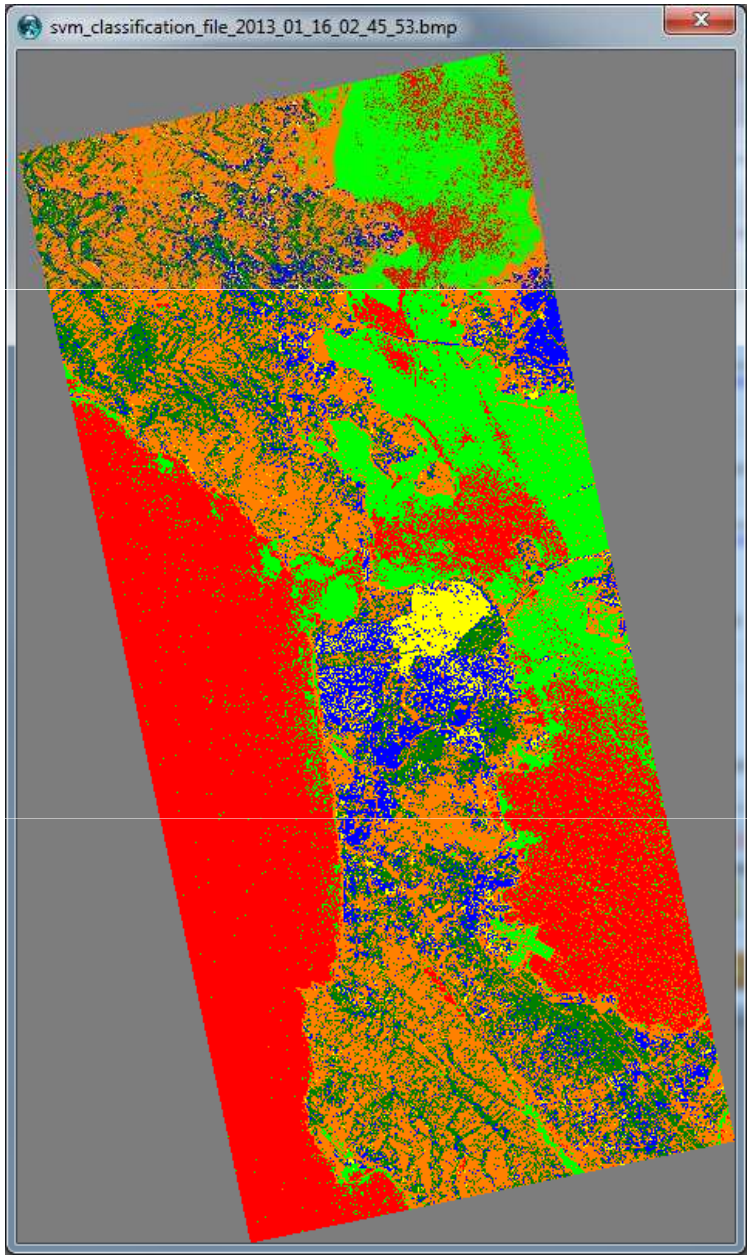
SUPPORT VECTOR MACHINE CLASSIFICATION



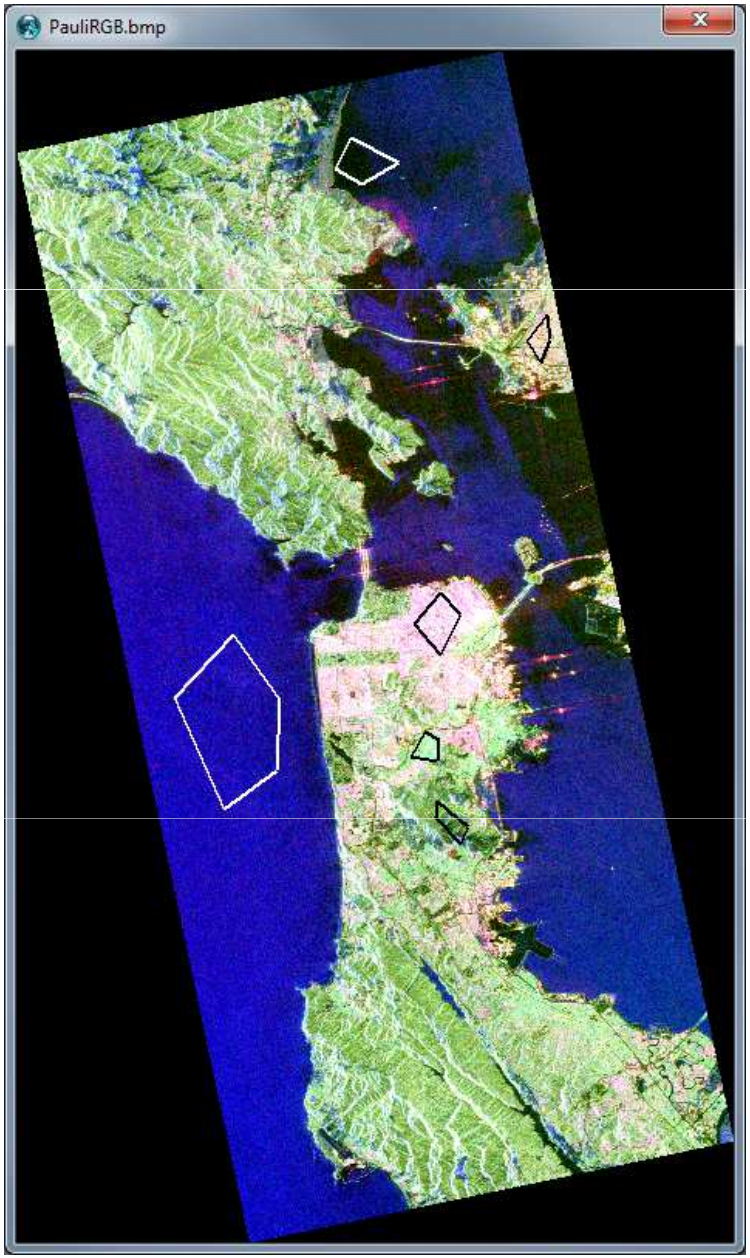


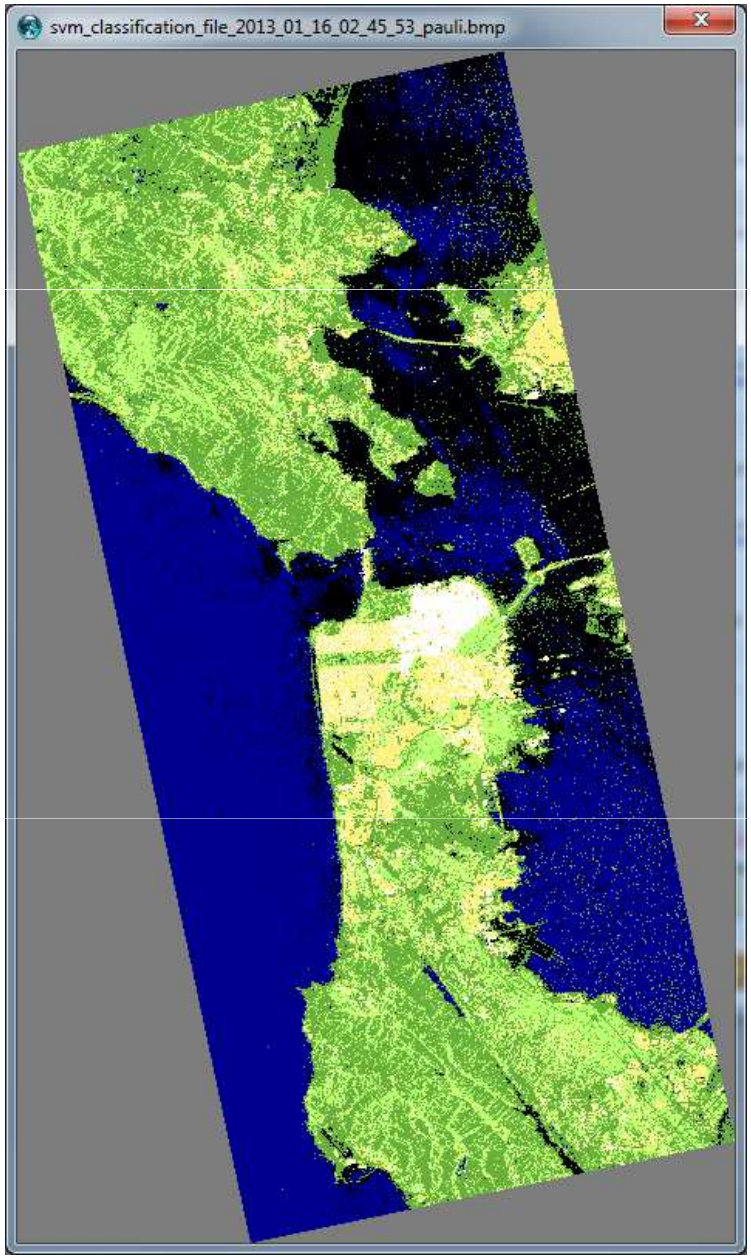
SUPPORT VECTOR MACHINE CLASSIFICATION





SUPPORT VECTOR MACHINE CLASSIFICATION





Questions ?