

→ 2nd ADVANCED COURSE ON RADAR POLARIMETRY

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



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASE nest

Quit About

PolSARpro Full Software
– Single Data Set
– Multi Data Sets

Spaceborne Sensors:
ALOS, ENVISAT
RADARSAT2, TerraSar, SIR-C

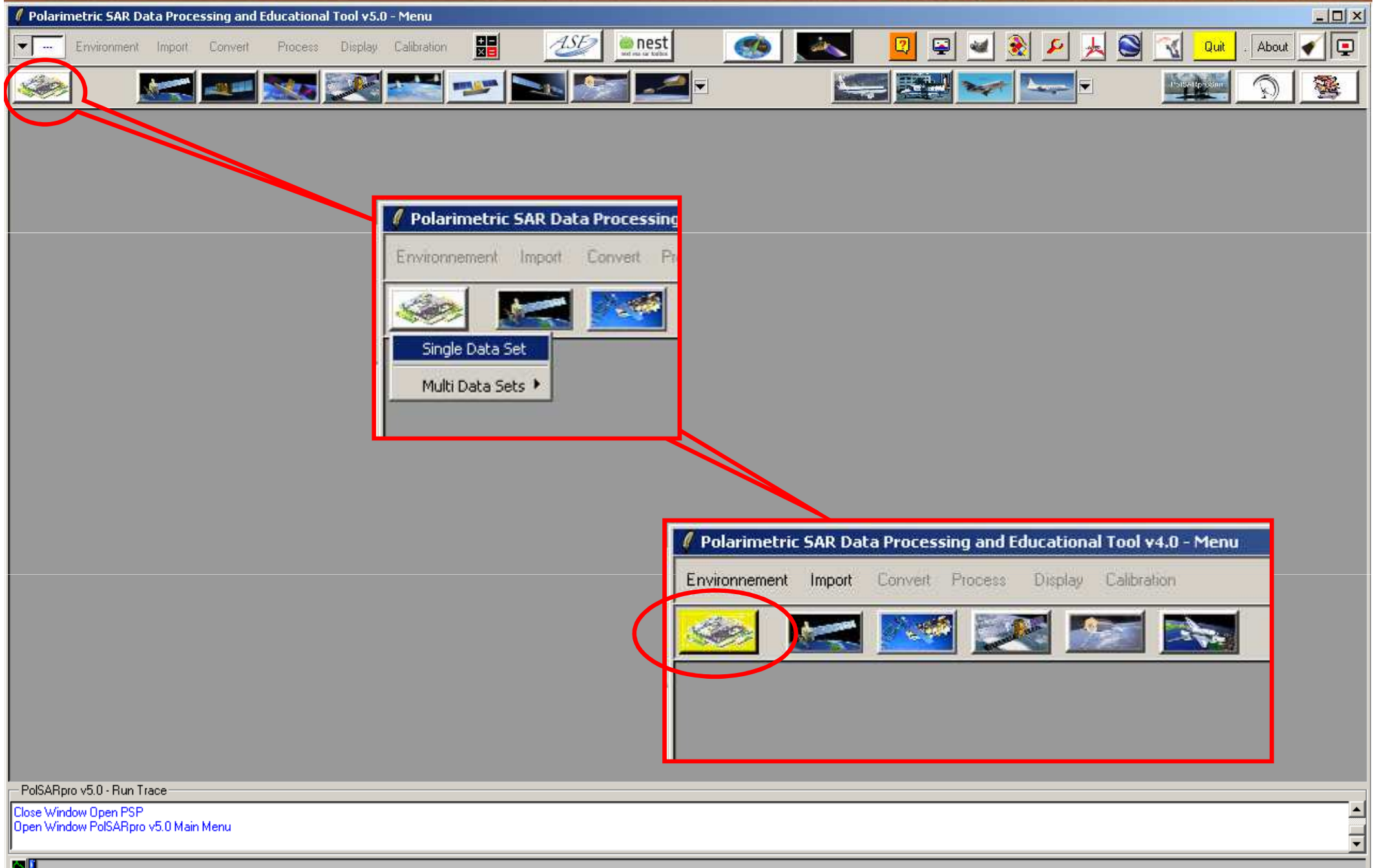
Airborne Sensors:
AIRSAR, Convair, EMISAR
ESAR, PISAR, RAMSES

PolSARpro – Single Data Set package

PolSARpro v5.0 - Run Trace

Close Window Open PSP
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MAIN MENU



MAIN MENU



Environment

Display

Import Data

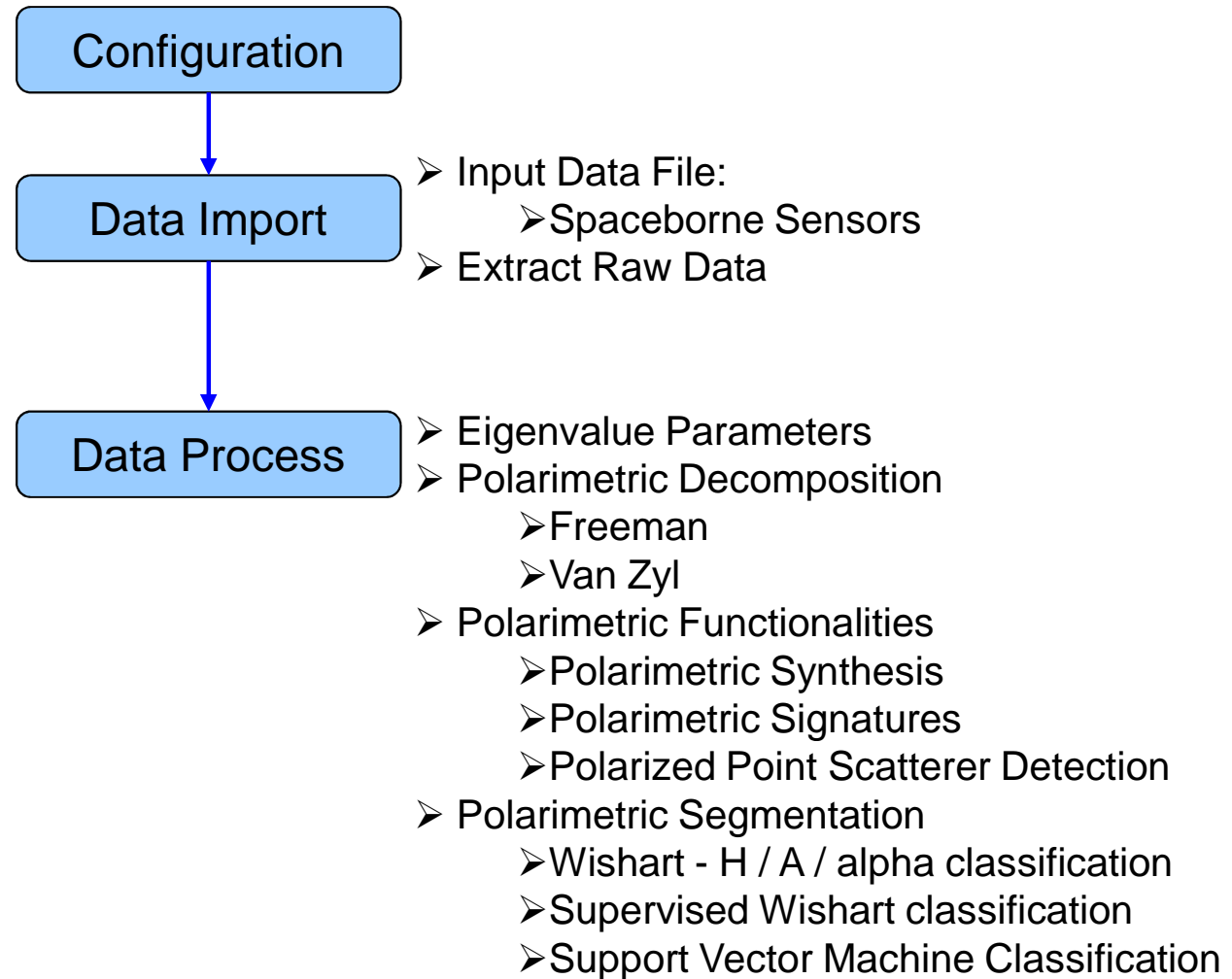
Convert Data

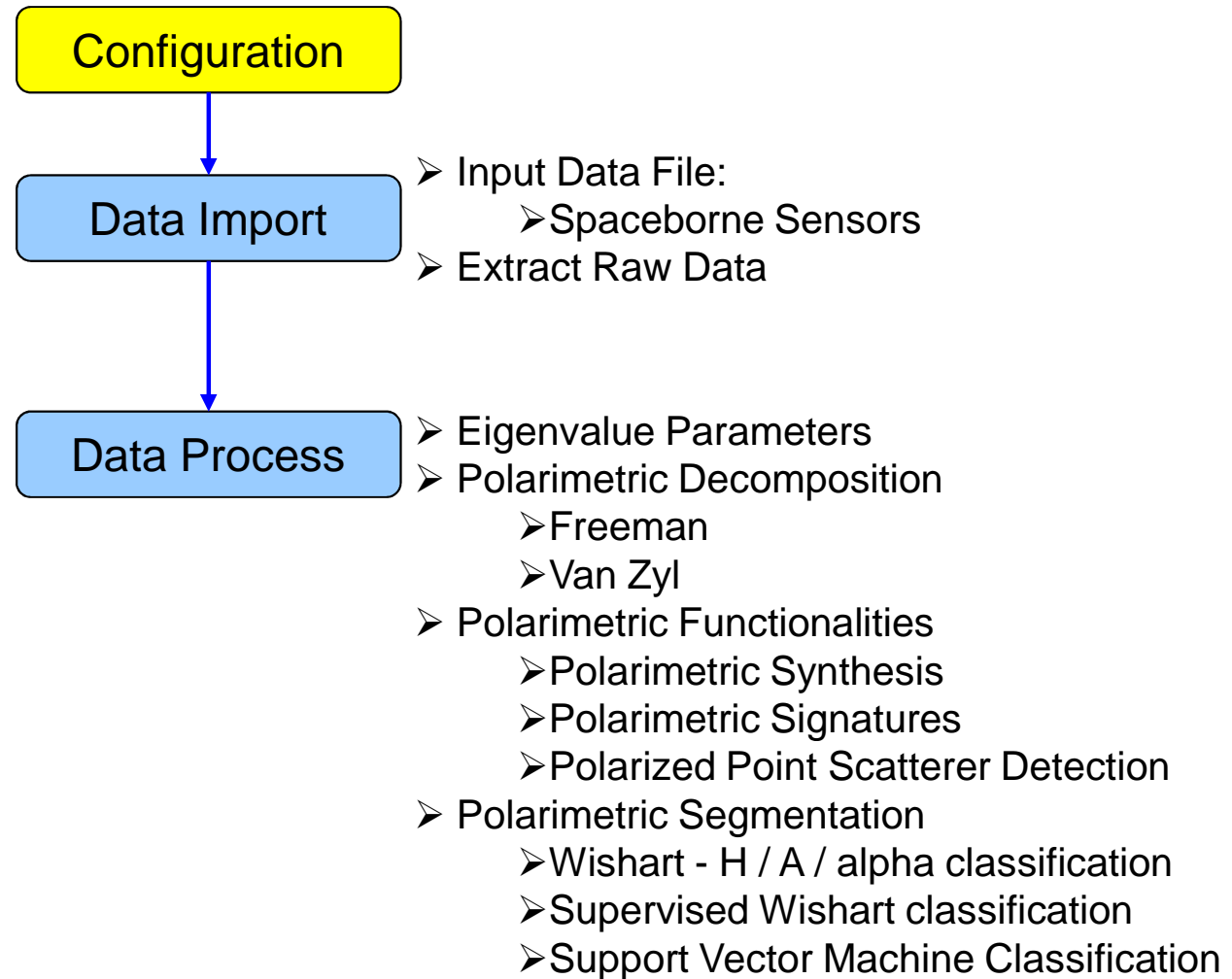
Process Data

Calibration Assessment

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ENVIRONNEMENT



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

Environment

Display

Polarimetric SAR Data Processing and Educational Tool v4.0 - Menu

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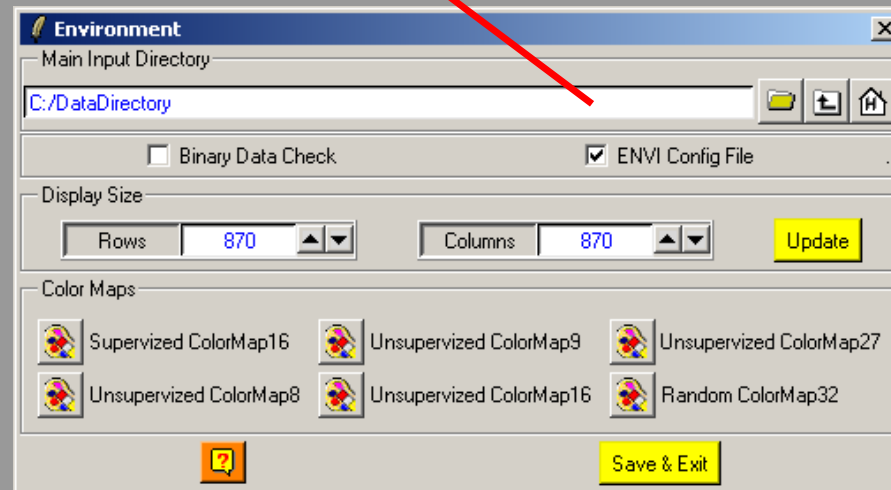
Calibration Assessment

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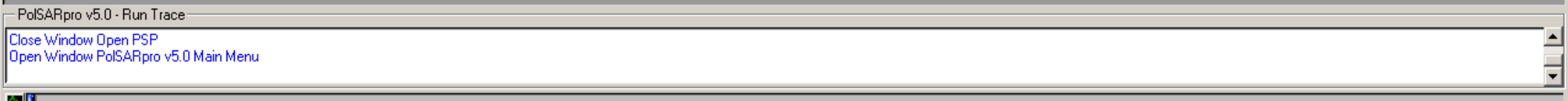


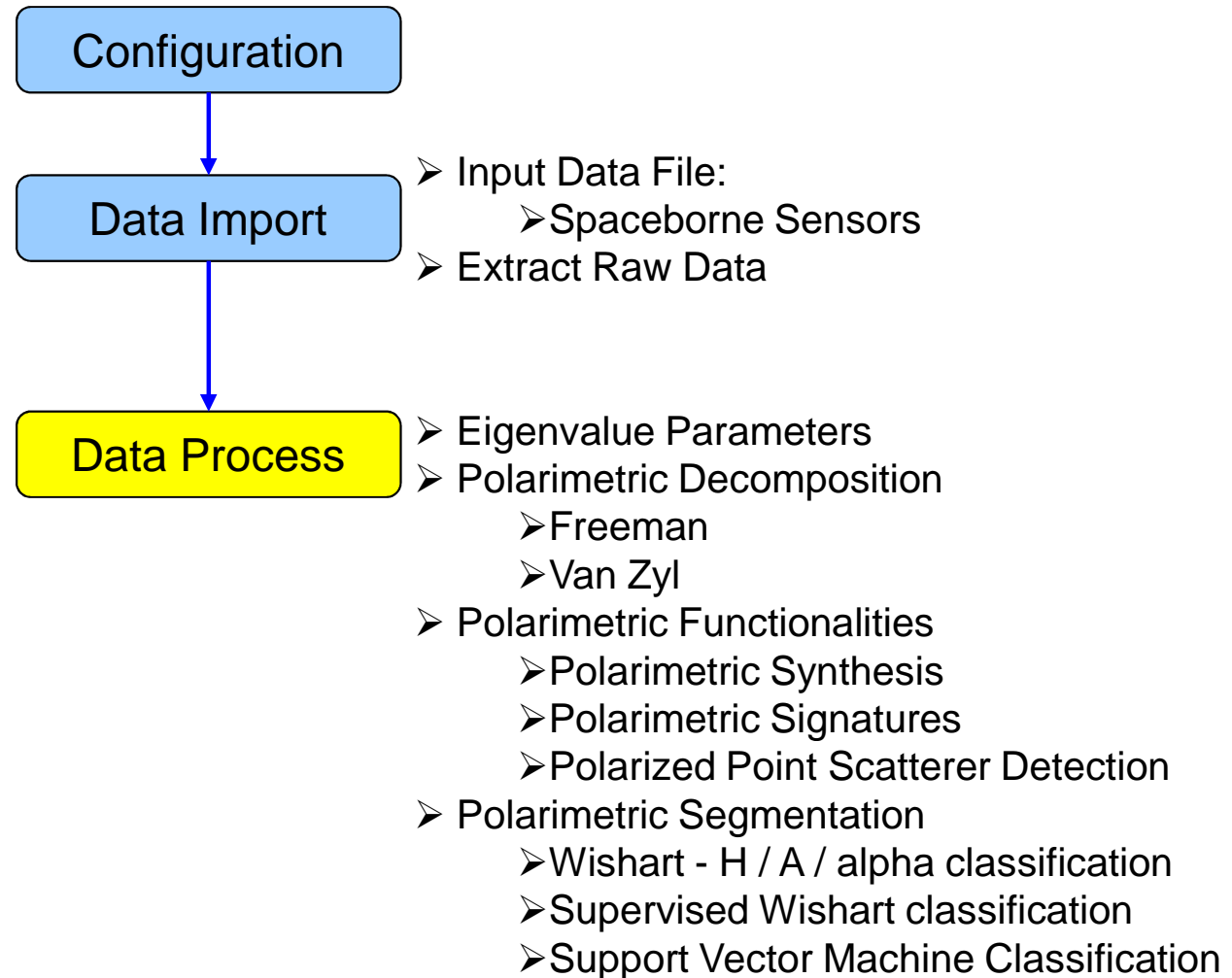
Configure Data Main Directory location



Input Directory: C:/ DataDirectory_MapReady

SAN_FRANCISCO_ALOS_MapReady





PROCESS DATA



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Circular (L / R)
Elliptical (phi, tau)

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RMB1 : Barnes 1 Decomposition
RMB2 : Barnes 2 Decomposition
SRC : Cloude Decomposition
WAH1 : Holm 1 Decomposition
WAH2 : Holm 2 Decomposition
HAA : H / A / Alpha Decomposition
FRE2 : Freeman 2 Components Decomposition
FRE3 : Freeman 3 Components Decomposition
VZ3 : Van Zyl 3 Components Decomposition
YAM3 : Yamaguchi 3 Components Decomposition
YAM4 : Yamaguchi 4 Components Decomposition
NEU : Neumann 2 Components Decomposition
KRO : Krogager Decomposition
CAM : Cameron Decomposition
TSVM : Touzi Decomposition

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Scattering Diversity
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Scattering Mechanism Entropy (Van Zyl)
Kozlov Anisotropy
Lueneburg Anisotropy
Polarized Point Scatterer Detection
Reflectivity Ratio
Differential Reflectivity (ZDR)

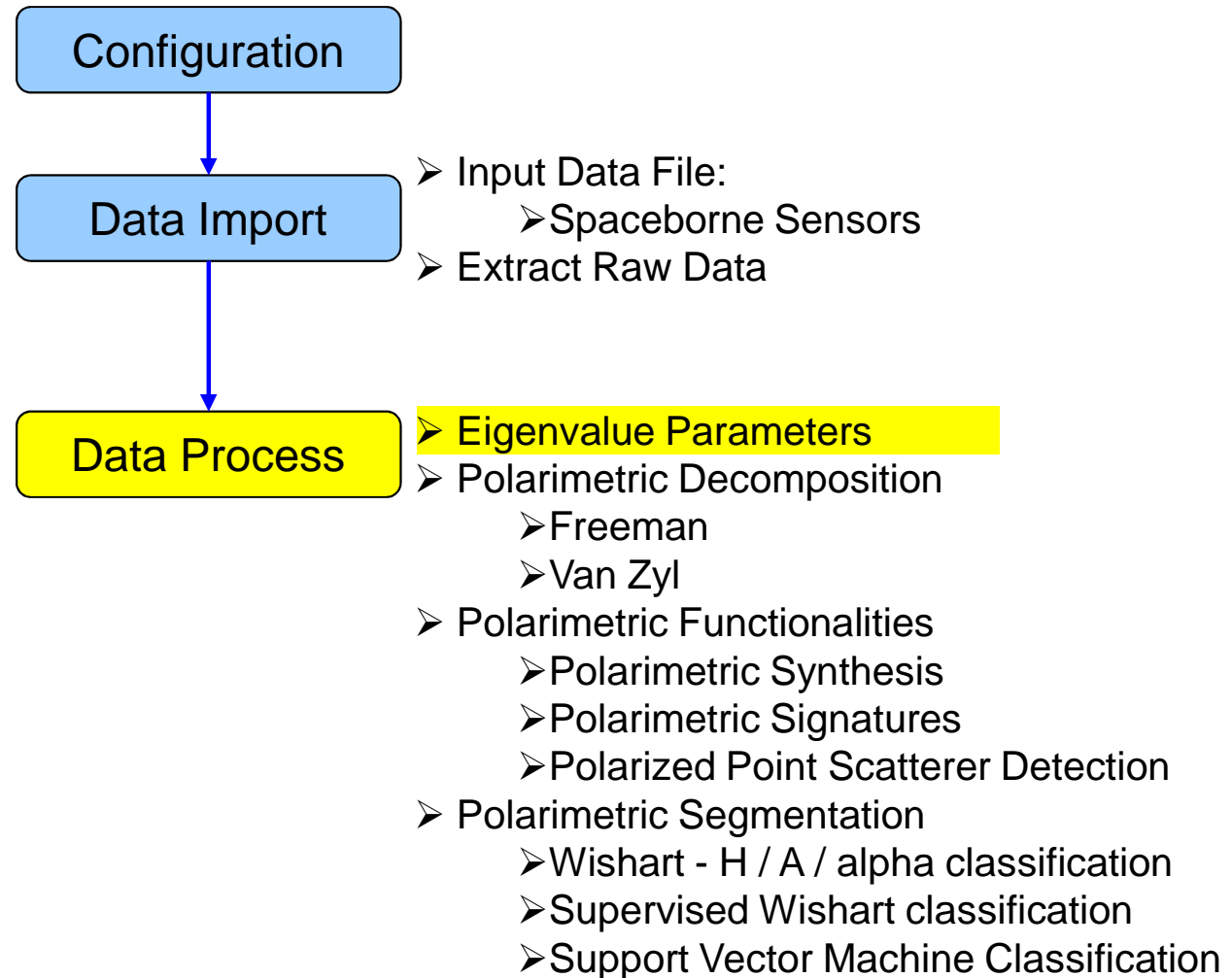
Polarisation Synthesis
Polarimetric Signature
Stokes Parameters
Compact Polarimetric Mode
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R.C.S Max
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RVOG PolSAR Inversion
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EIGENVALUE SET PARAMETERS



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ASE nest

Quit About

Data Processing: H / A / Alpha Eigenvalue Set Parameters

Input Directory: C:/DataDirectory_MapReady/T3

Output Directory: C:/DataDirectory_MapReady / T3

Init Row: 1 End Row: 1544 Init Col: 1 End Col: 932

<input type="checkbox"/> Eigenvalues (L1 , L2 , L3)	<input type="checkbox"/> BMP
<input checked="" type="checkbox"/> Pseudo Probabilities (p1 , p2 , p3)	<input checked="" type="checkbox"/> BMP
<input type="checkbox"/> Anisotropy (A) (p2 , p3)	<input type="checkbox"/> BMP
<input type="checkbox"/> Anisotropy12 (A12) (p1 , p2)	<input type="checkbox"/> BMP
<input type="checkbox"/> Eigenvalues Relative Difference (S.E.R.D - D.E.R.D)	<input type="checkbox"/> BMP
<input checked="" type="checkbox"/> Polarisation Asymmetry (p1-p3 , 1-3p3)	<input checked="" type="checkbox"/> BMP
<input checked="" type="checkbox"/> Polarisation Fraction (1-3p3)	<input checked="" type="checkbox"/> BMP
<input checked="" type="checkbox"/> Lueneburg Anisotropy	<input checked="" type="checkbox"/> BMP
<input type="checkbox"/> Radar Vegetation Index (R.V.I)	<input type="checkbox"/> BMP
<input type="checkbox"/> Pedestal Height	<input type="checkbox"/> BMP
<input checked="" type="checkbox"/> Shannon Entropy (H = Hi + Hp)	<input checked="" type="checkbox"/> BMP

Window Size: 1

Equivalence between [T] and [C] eigen-decompositions.

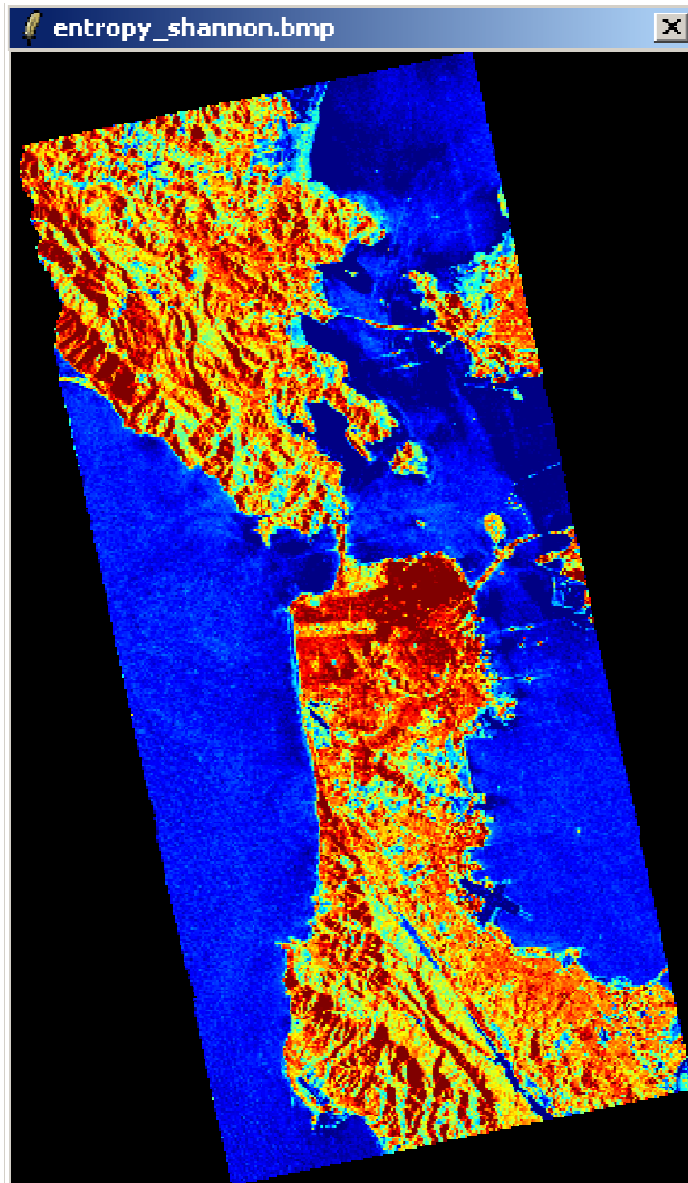
PolSARpro v5.0 - Run Tra

Close Window Open PSP
Open Window PolSARpro v5.0 main menu

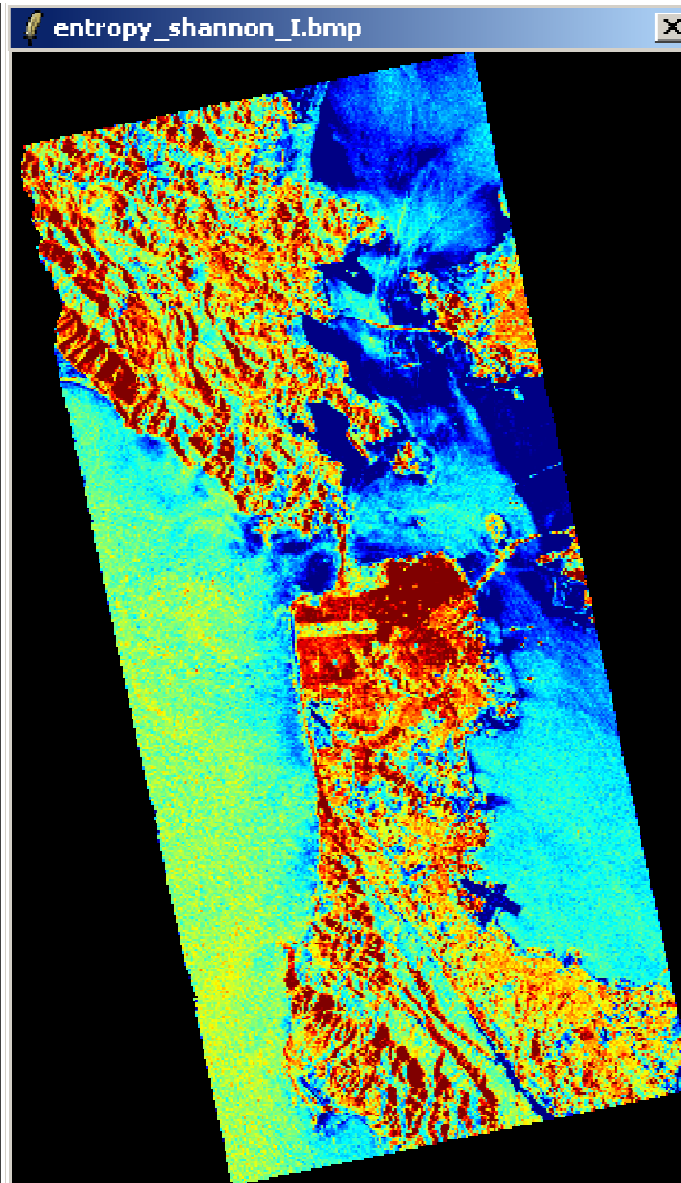
Do it Yourself:
Select some elements, set the parameters and view the corresponding BMP files (select BMP).

Window Size = 3

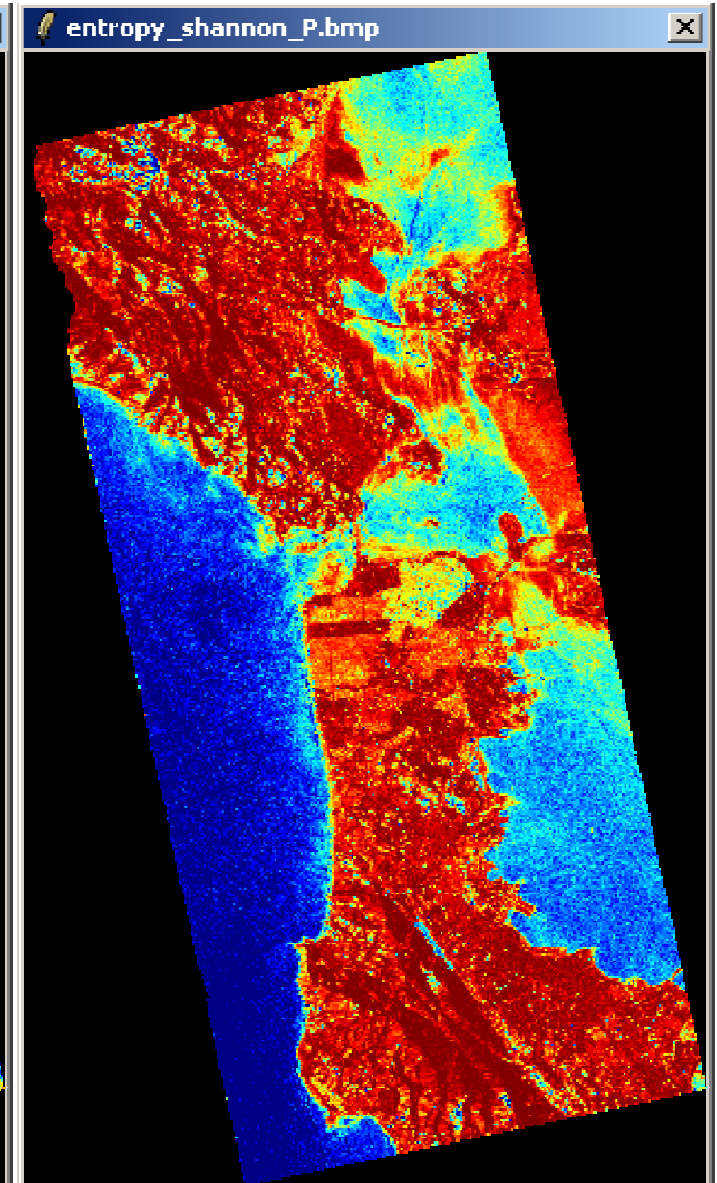
Entropy Shannon



Entropy I



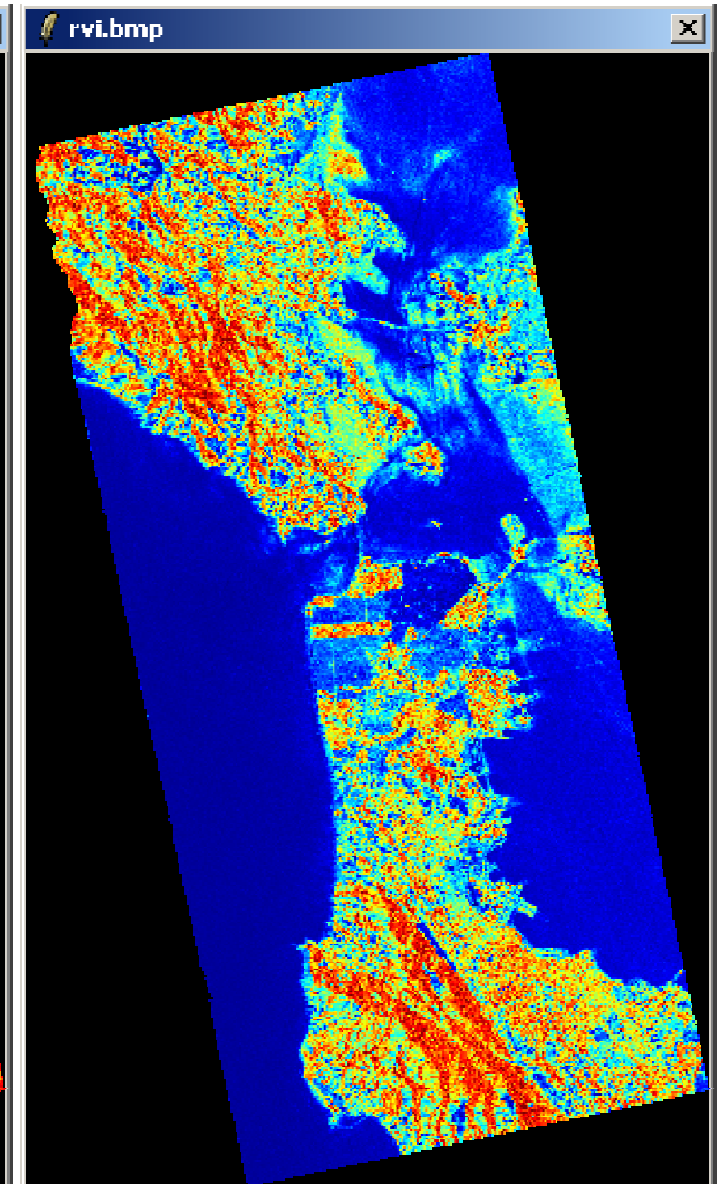
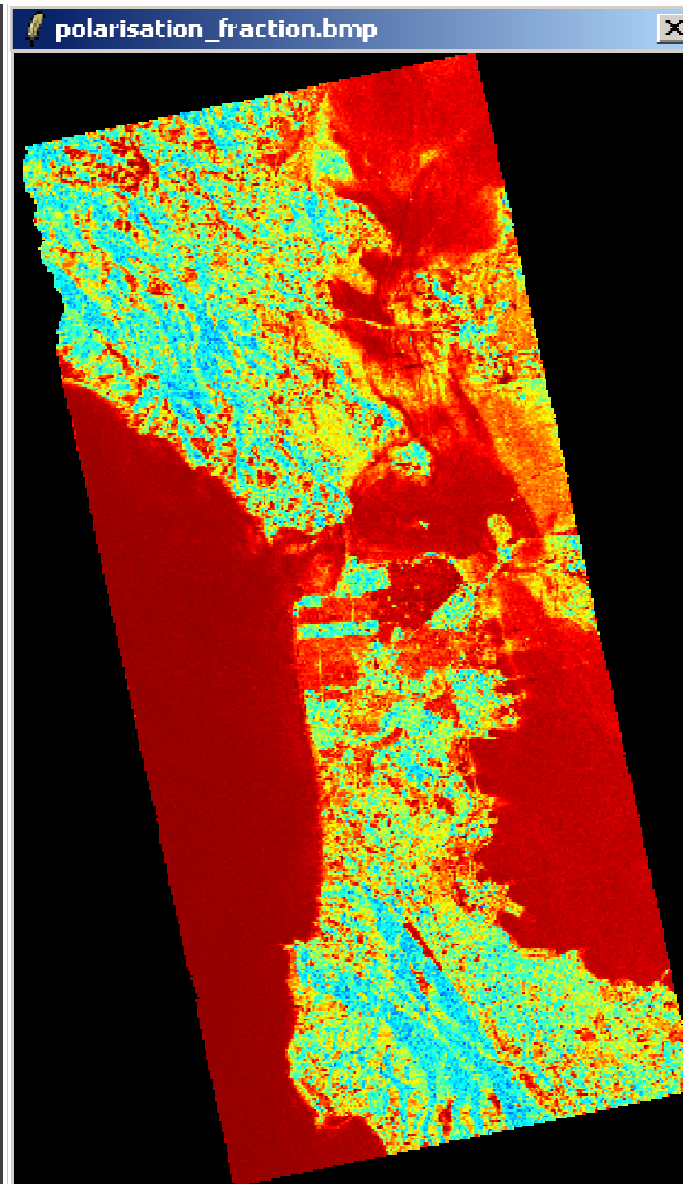
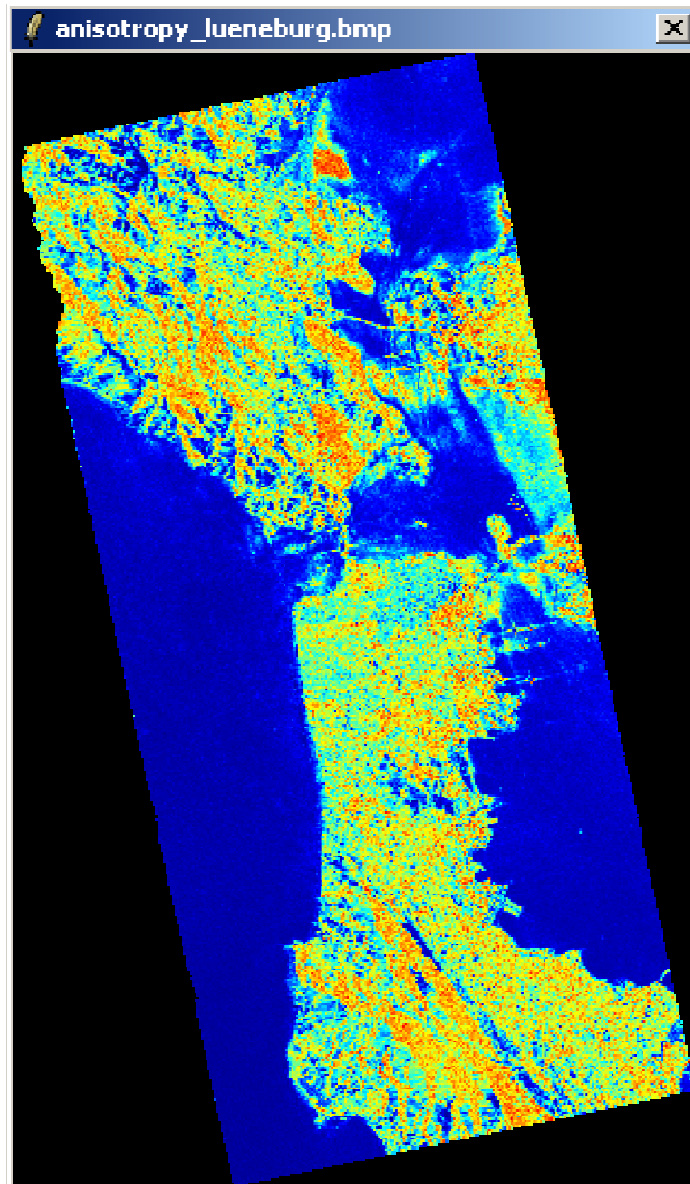
Entropy P

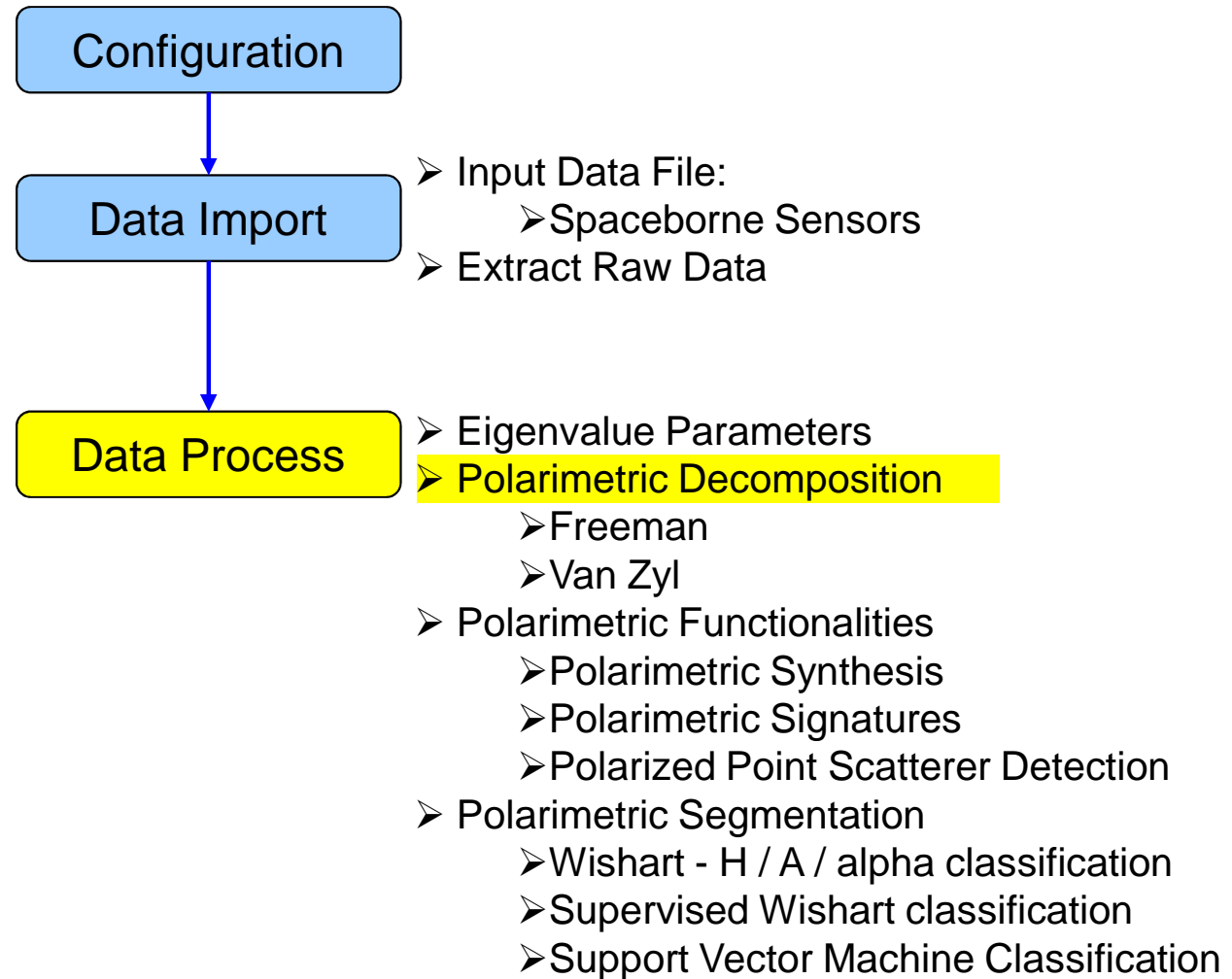


Anisotropy Lueneburg

Polarisation Fraction

R.V.I





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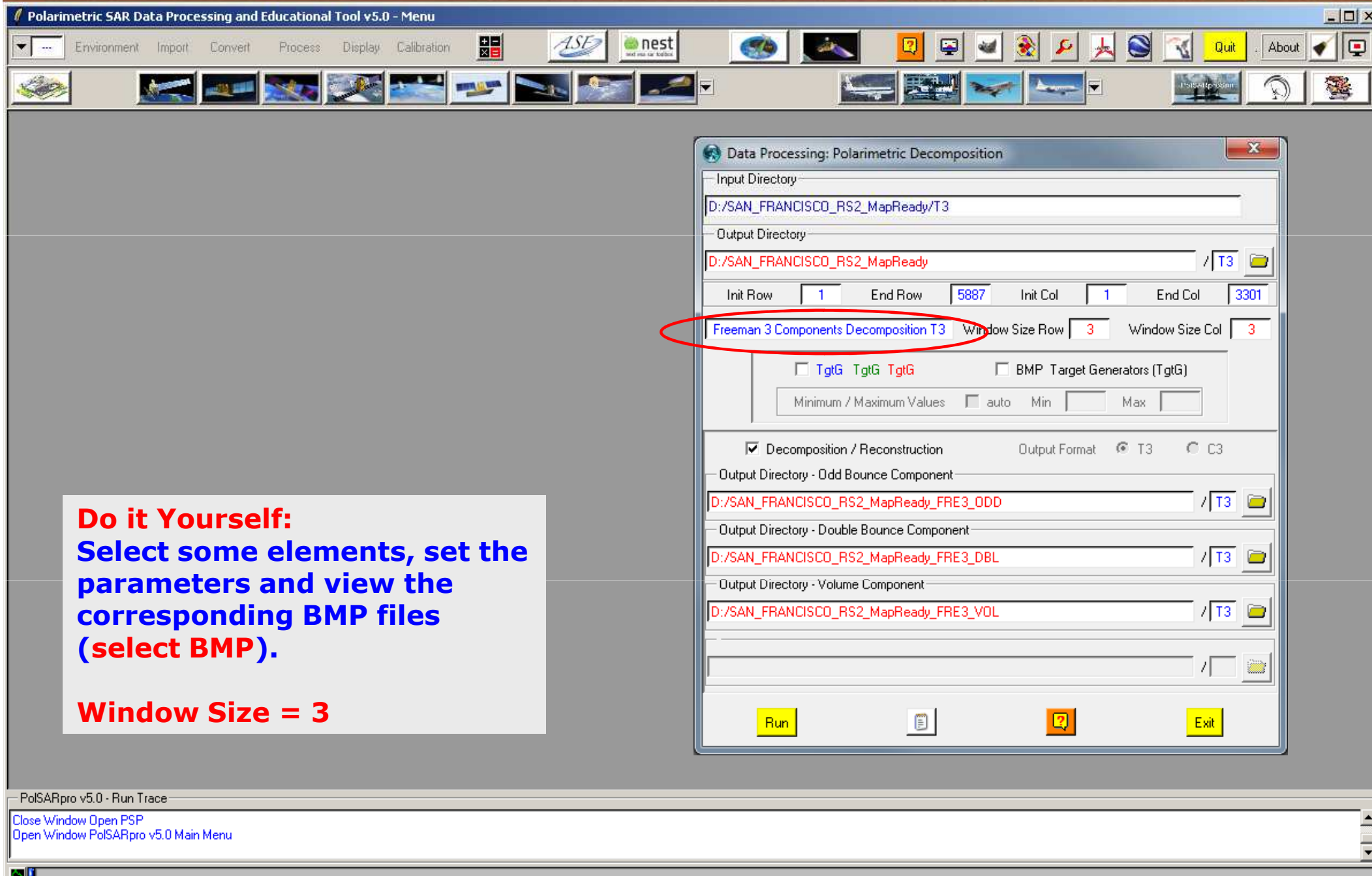
Polarisation Synthesis
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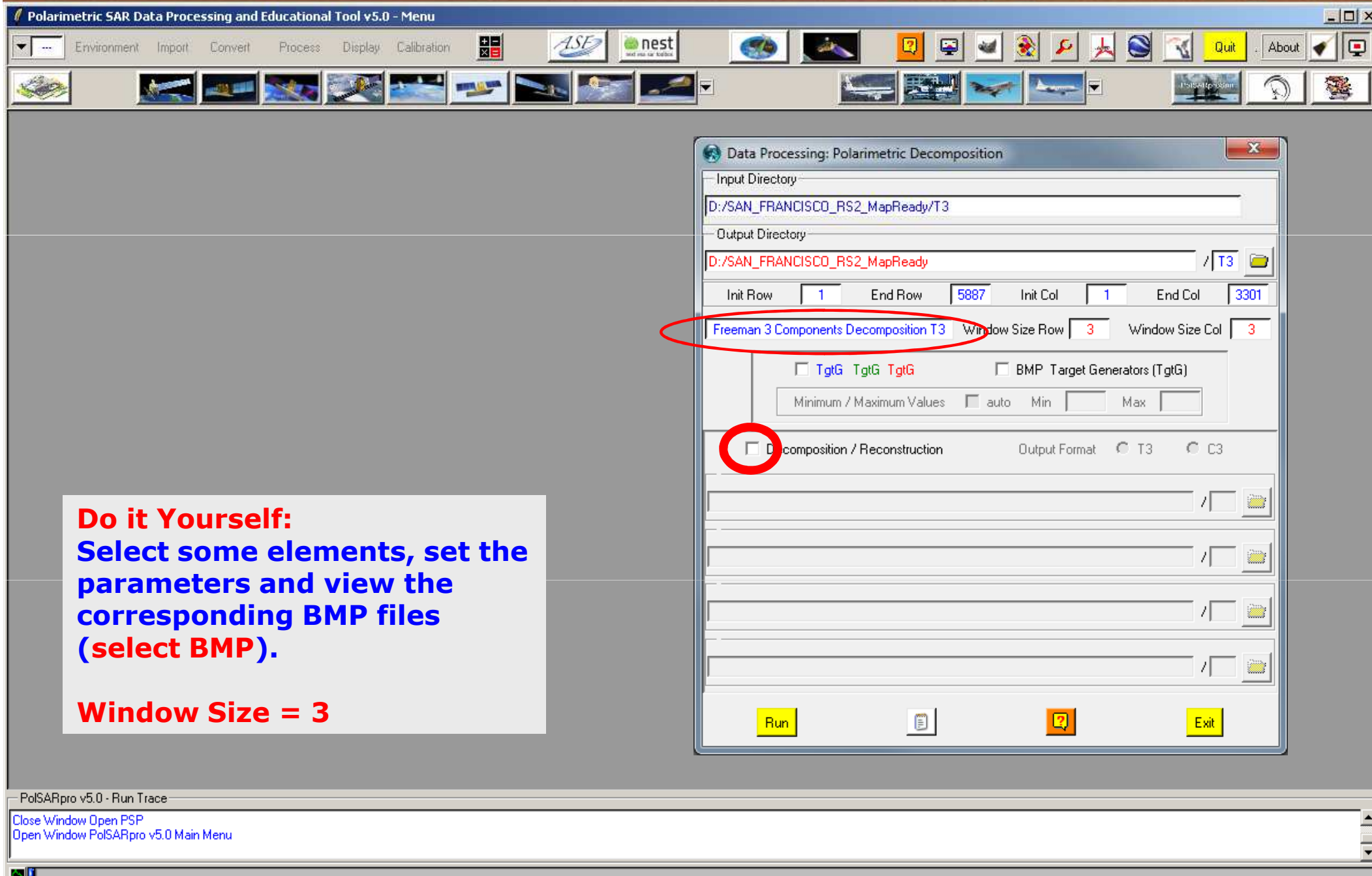
PolSARpro v5.0 - Run Trace
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Do it Yourself:
Select some elements, set the parameters and view the corresponding BMP files (select BMP).

Window Size = 3

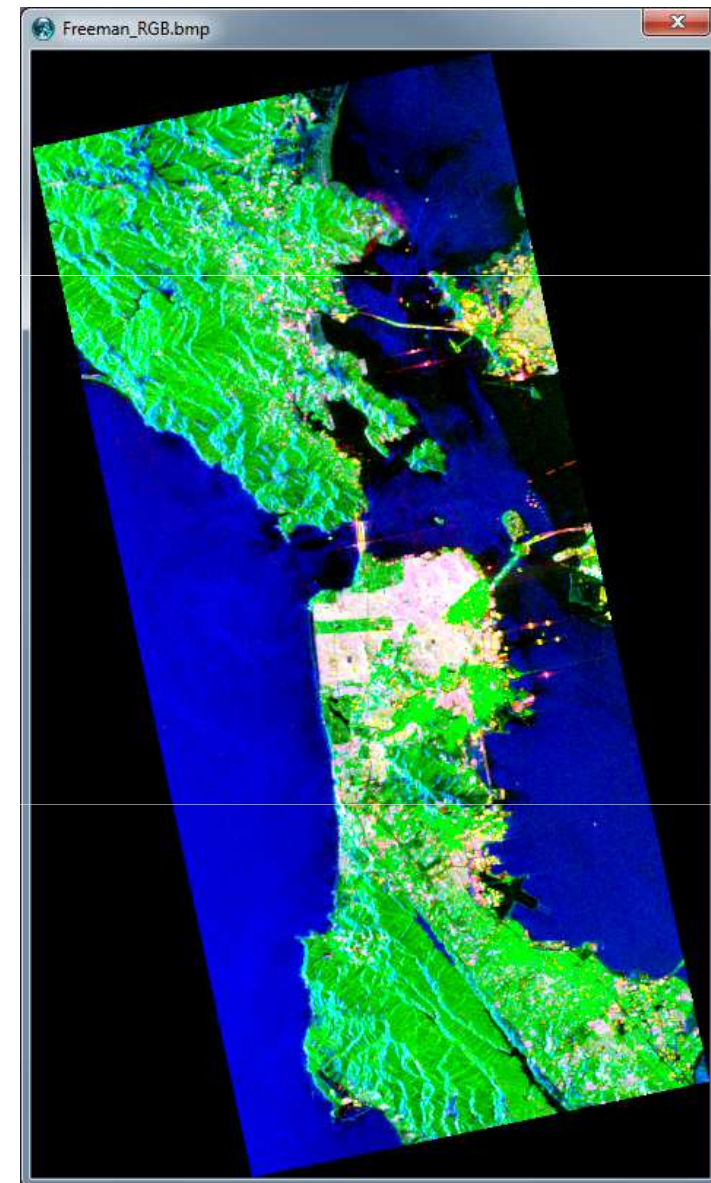
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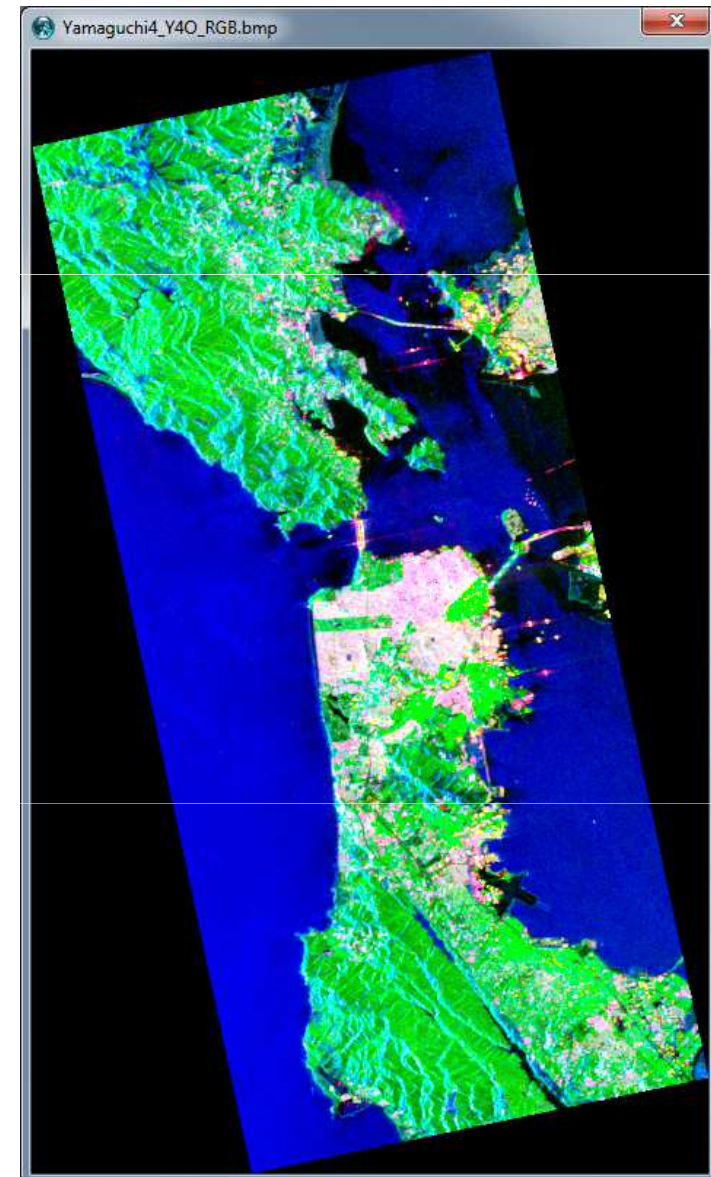
Do it Yourself:
Select some elements, set the parameters and view the corresponding BMP files (select BMP).

Window Size = 3

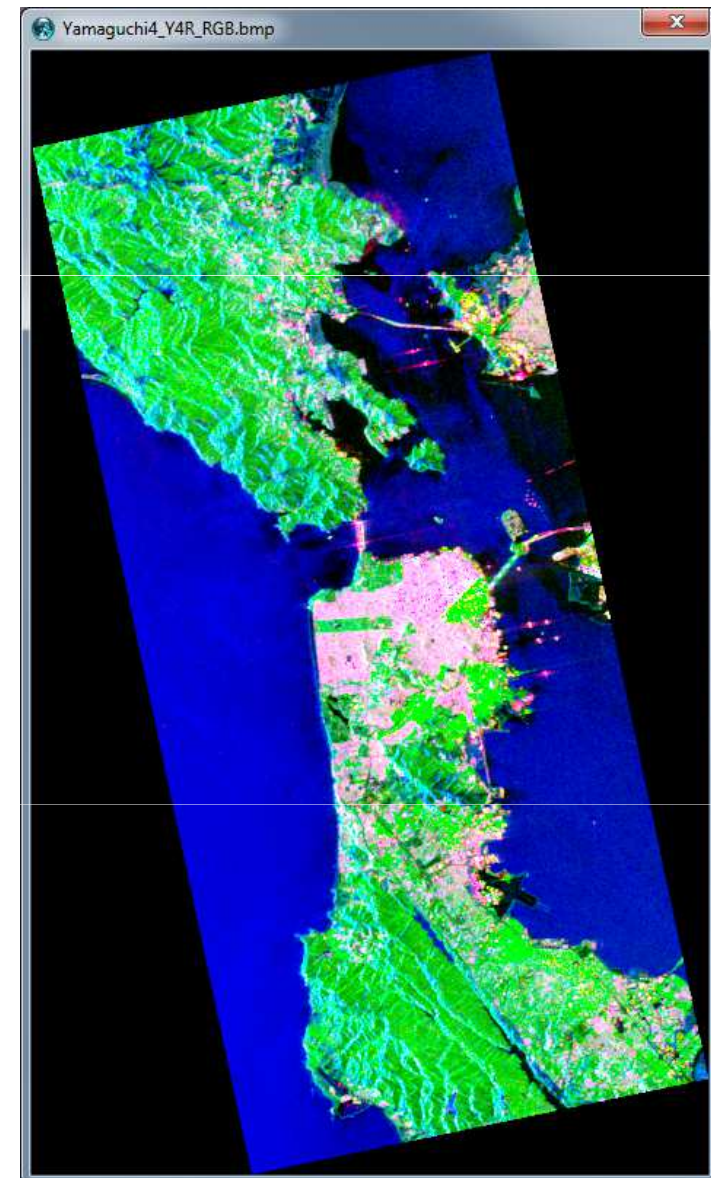
Pauli Freeman 3



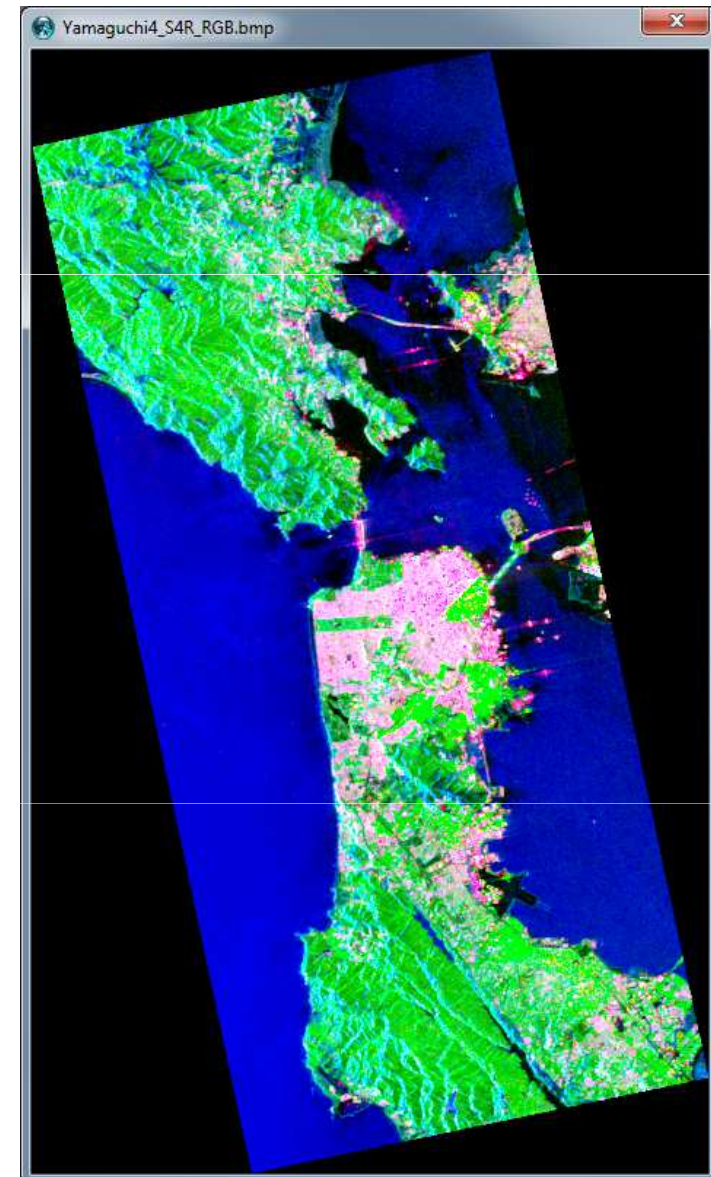
Pauli Yamaguchi Y40



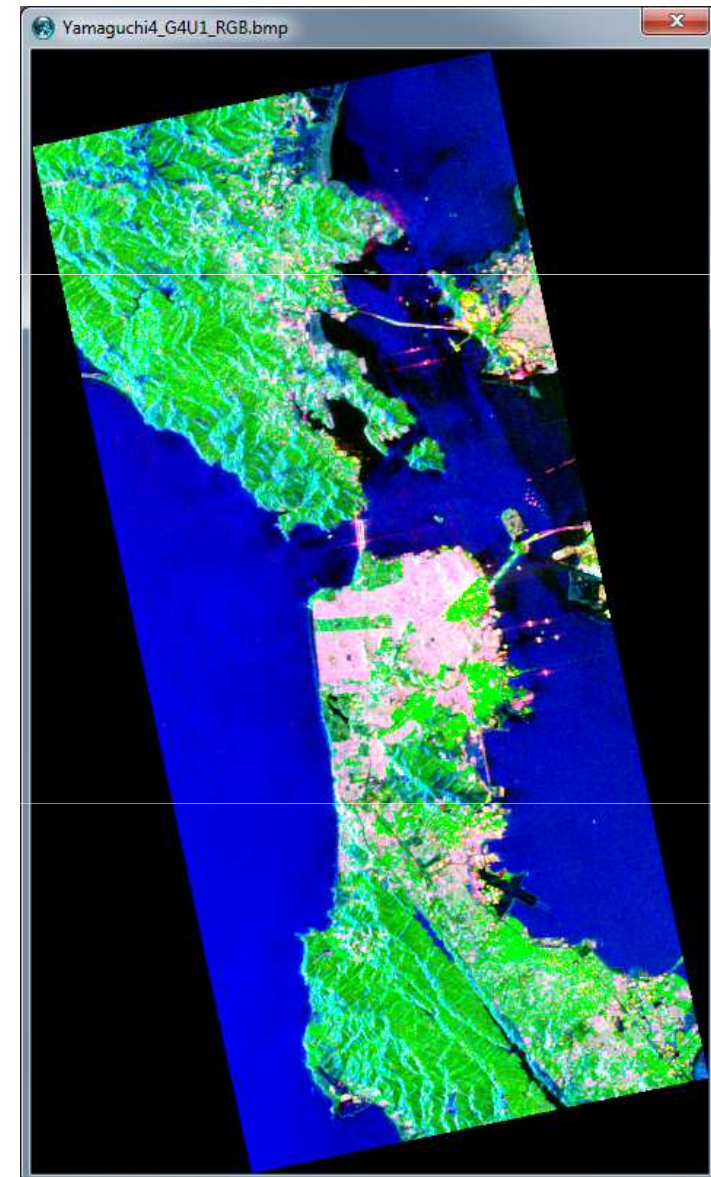
Pauli Yamaguchi Y4R



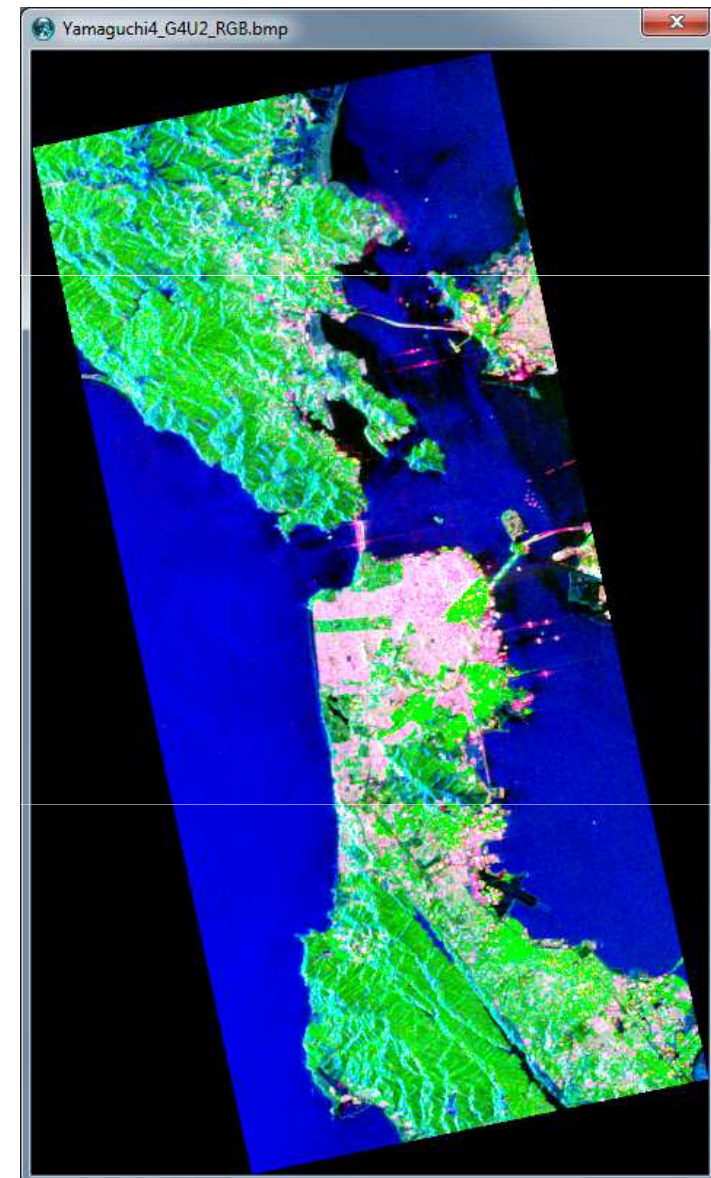
Pauli Yamaguchi S4R



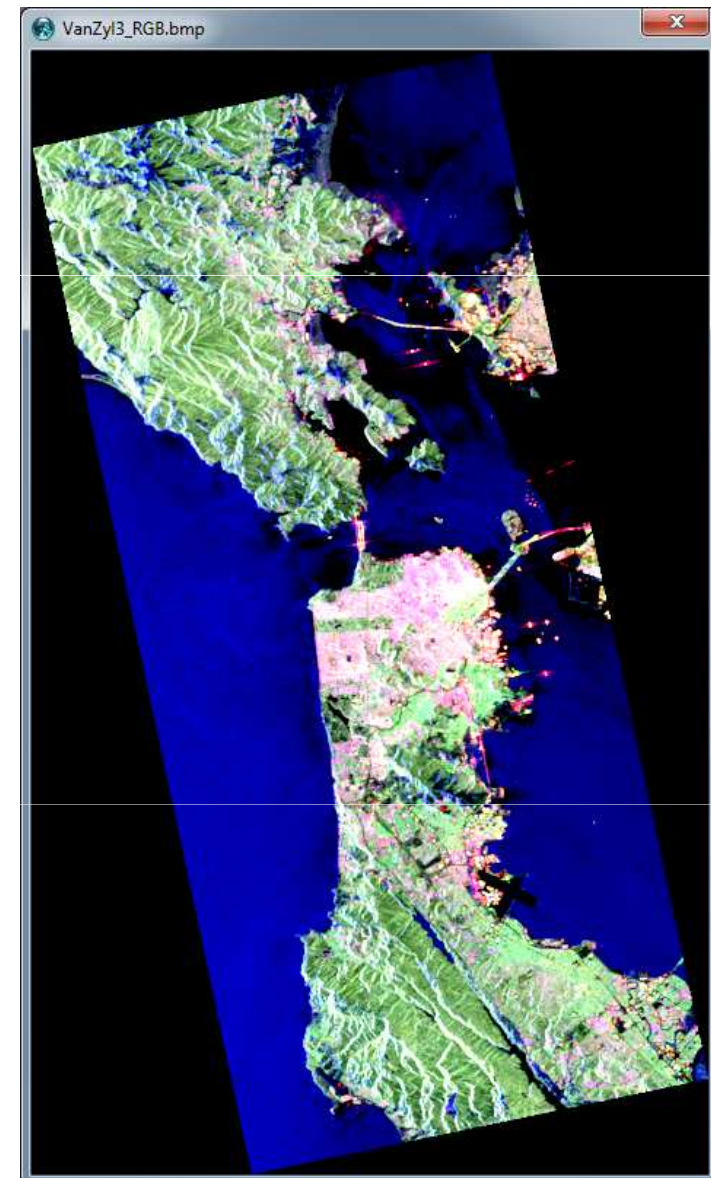
Pauli Yamaguchi G4U1

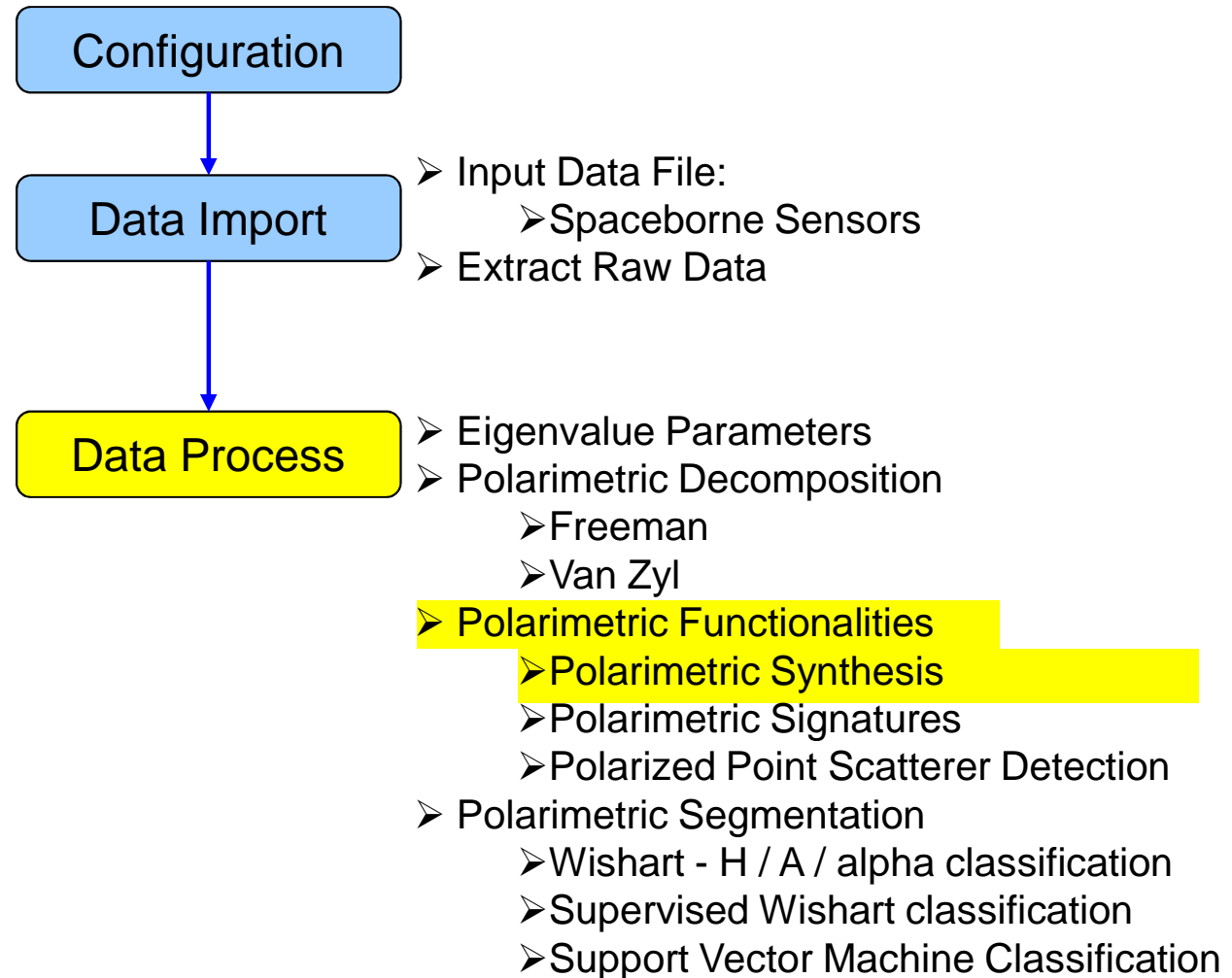


Pauli Yamaguchi G4U2



Pauli Van Zyl 3





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POLARIZATION SYNTHESIS



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Data Processing: Polarisation Synthesis

Input Directory
C:/DataDirectory_MapReady/T3

Output Directory
C:/DataDirectory_MapReady / T3

Init Row 1 End Row 1544 Init Col 1 End Col 932

000 030 045 060 Left
 090 120 135 150 Right

RGB BMP File Pauli Decomposition |S11+S22| |S12+S21| |S11-S22|
 Sinclair Decomposition |S11| |(S12+S21)/2| |S22|

BMP File for each |S11| (dB)

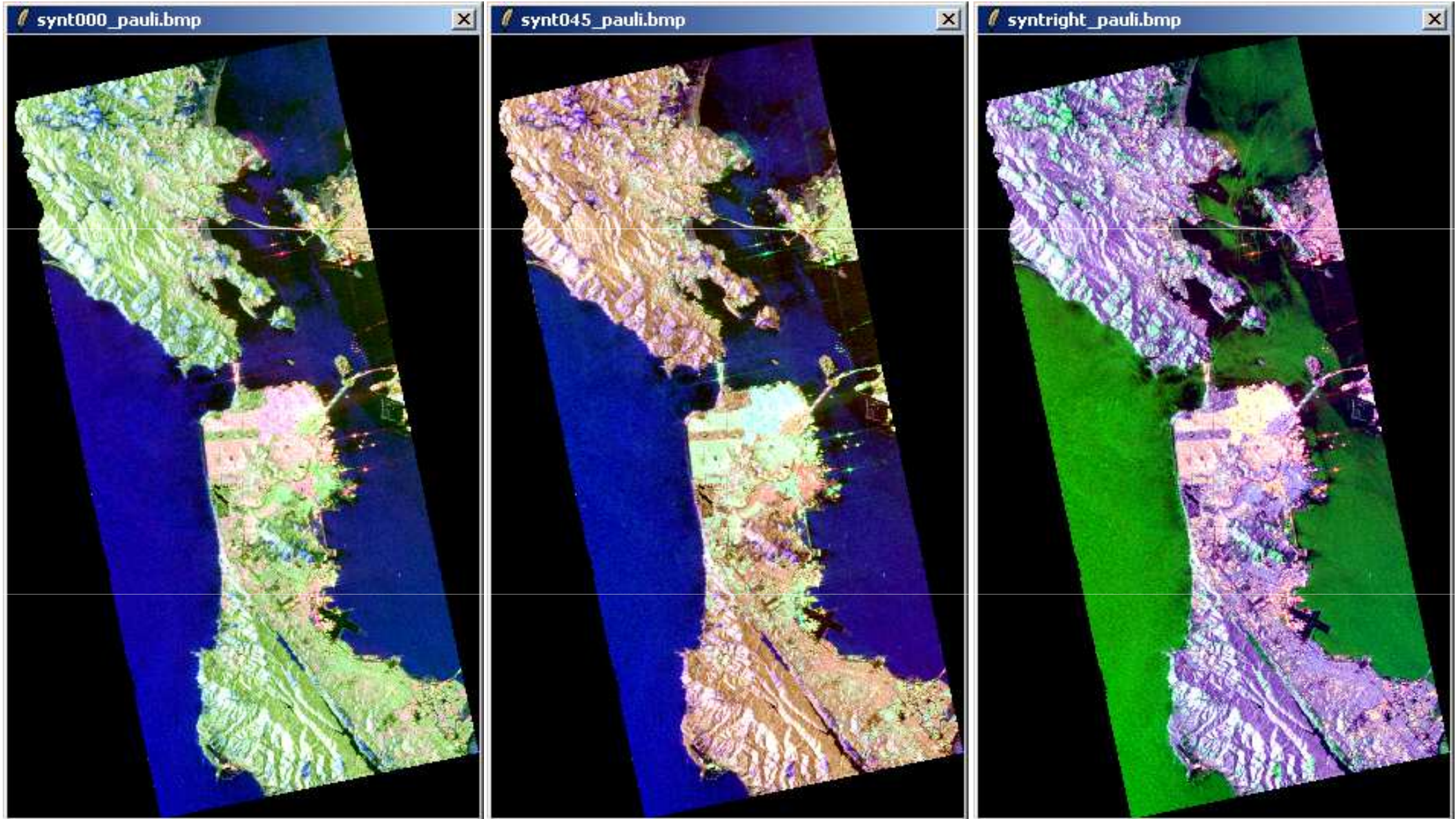
Reset

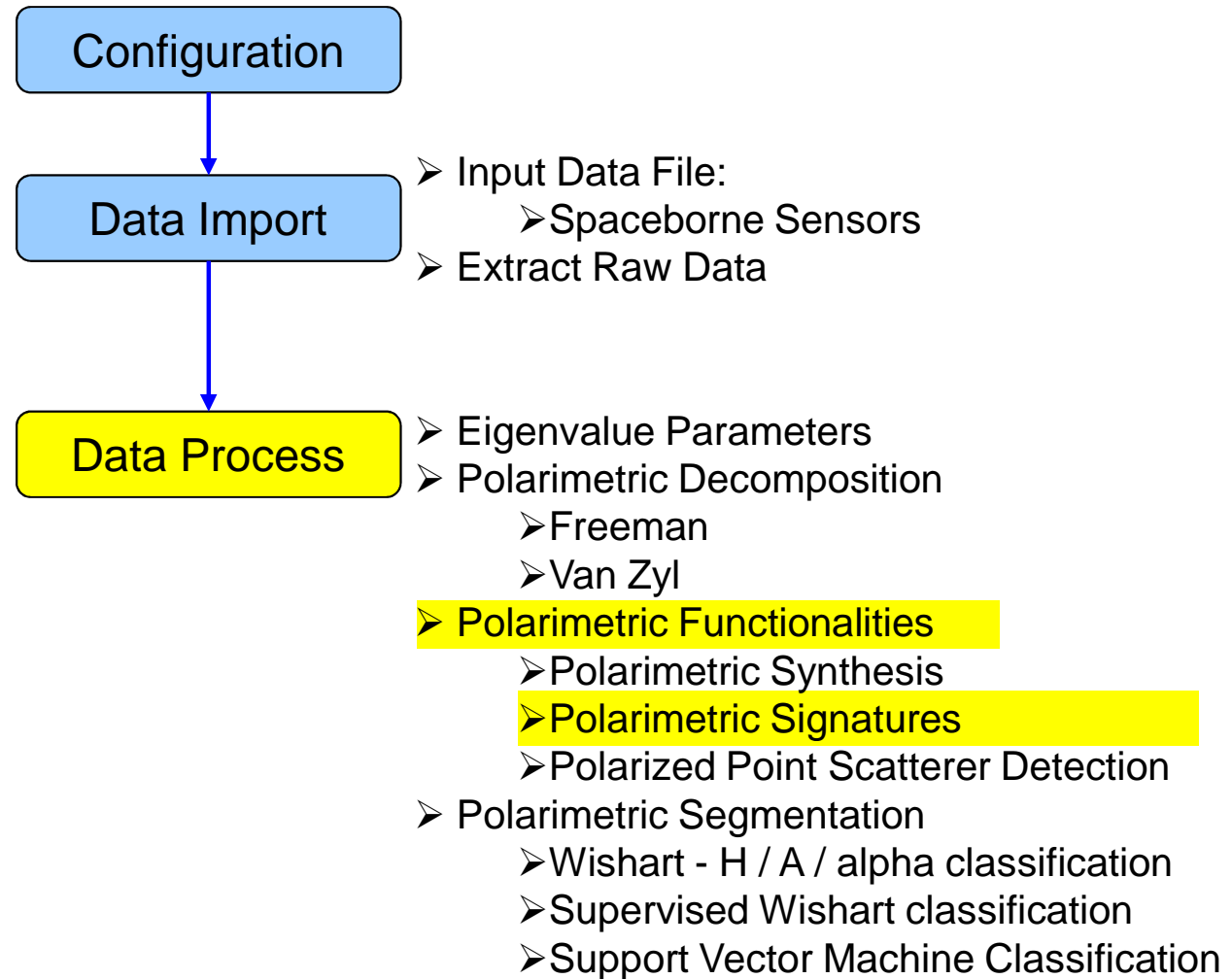
Run ? Exit

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POLARIMETRIC SIGNATURES



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Polarimetric Signatures

Representation

- Mesh
- Mesh-Color
- Contour
- Mesh & Contour
- Surface
- Mesh & Surface

Pixel Values

X: 505 Y: 755 Val: []

Format

- dB
- lin

Orientation

[] [] 60 [] [] 30

Mouse Position

X: 505 Y: 755 Val: []

Plot [] Close [] Exit []

PauliRGB.bmp

PY3.0

Image Size

C: 932 R: 1544

Mouse Position

X: 654 Y: 801

Zoom

1:3

Color

0.00 1.00

0.37

Exit []

Co-Pol Signature

Normalized Polarimetric Signature - Co-polarisation channel

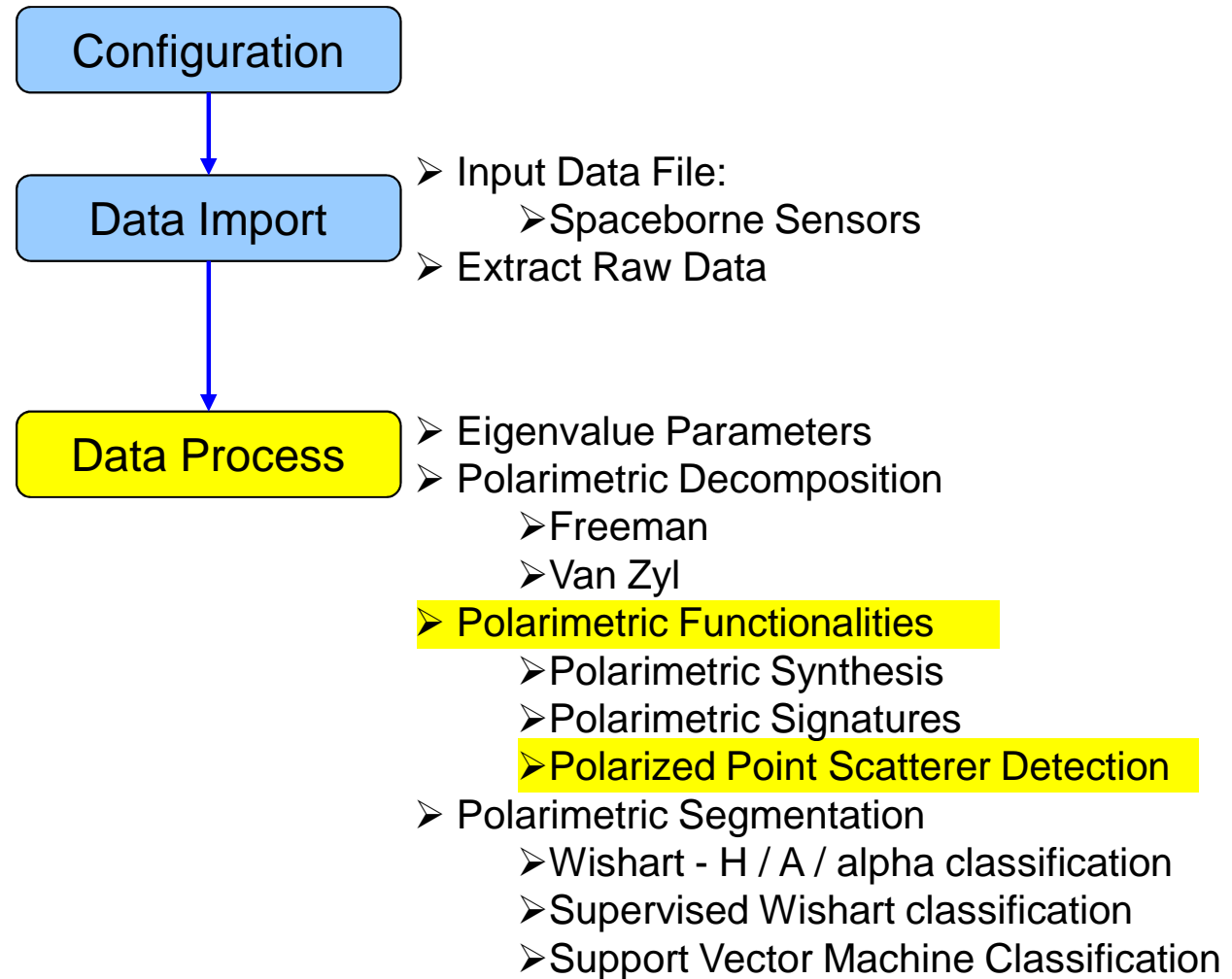
Max = 3.012995 Min = 0.867528

X-Pol Signature

Normalized Polarimetric Signature - Cross-polarisation channel

Max = 1.183607 Min = 0.055825

Close window open []
Open Window PolSARpro v5.0 Main Menu



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FRE2 : Freeman 2 Components Decomposition
FRE3 : Freeman 3 Components Decomposition
VZ3 : Van Zyl 3 Components Decomposition
YAM3 : Yamaguchi 3 Components Decomposition
YAM4 : Yamaguchi 4 Components Decomposition
NEU : Neumann 2 Components Decomposition

KRO : Krogager Decomposition
CAM : Cameron Decomposition
TSVM : Touzi Decomposition

Matrix Elements
Correlation Coefficients
Elliptical Basis Change
Polarimetric Speckle Filter
H / A / Alpha Decomposition
Polarimetric Decompositions
Polarimetric Functionalities - 1
Polarimetric Functionalities - 2
Polarimetric Segmentation
Polarimetric Data Analysis
Polarimetric Data Clustering
Batch Process

H / A / Alpha Classification
H / A / Alpha - Wishart Classification
Fuzzy - H / Alpha Classification
Wishart Supervised Classification
Rule-Based Hierarchical Classification
Basic Scattering Mechanism Identification
SVM Supervised Classification

Faraday Rotation Estimation
Conformity Coefficient
Scattering Predominance
Scattering Diversity
Degree of Purity
Depolarisation Index
Alpha Approximation (Praks & Colin)
Entropy Approximation (Praks & Colin)
Scattering Mechanism Entropy (Freeman)
Scattering Mechanism Entropy (Van Zyl)
Kozlov Anisotropy
Lueneburg Anisotropy
Polarized Point Scatterer Detection
Reflectivity Ratio
Differential Reflectivity (ZDR)

Polarisation Synthesis
Polarimetric Signature
Stokes Parameters
Compact Polarimetric Mode
O.P.C.E
R.C.S Max
Surface Inversion
RVOG PolSAR Inversion
Sub-Aperture Analysis
DEM Estimation
Polarisation Orientation Compensation

Data Statistics
Data Histograms
Data Profiles
Histogram Based Statistics
Texture Analysis

Clustering Process
Parameter Averaging
Data Sets Averaging

Decomposition Applications

PolSARpro v5.0 - Run Trace
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

POLARIZED POINT SCATTERER DETECTION



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASPE nest

Quit About

Data Processing: Parameters

Input Directory
D:/SAN_FRANCISCO_ALOS_MapReady/T3

Output Directory
D:/SAN_FRANCISCO_ALOS_MapReady / T3

Init Row 1 End Row 1544 Init Col 1 End Col 928

Output File
pps_detection.bin

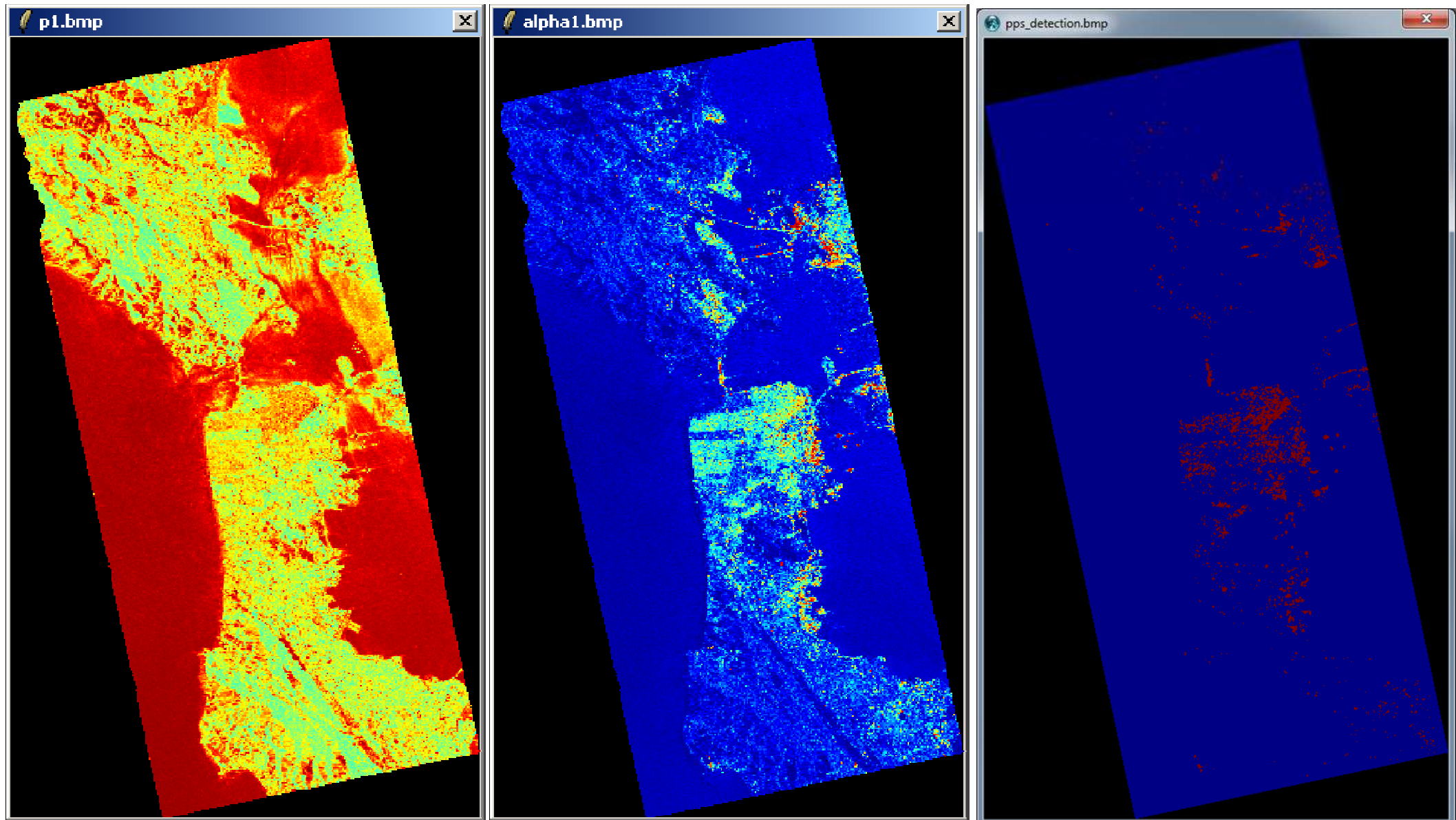
BMP Window Size Row 3 Window Size Col 3

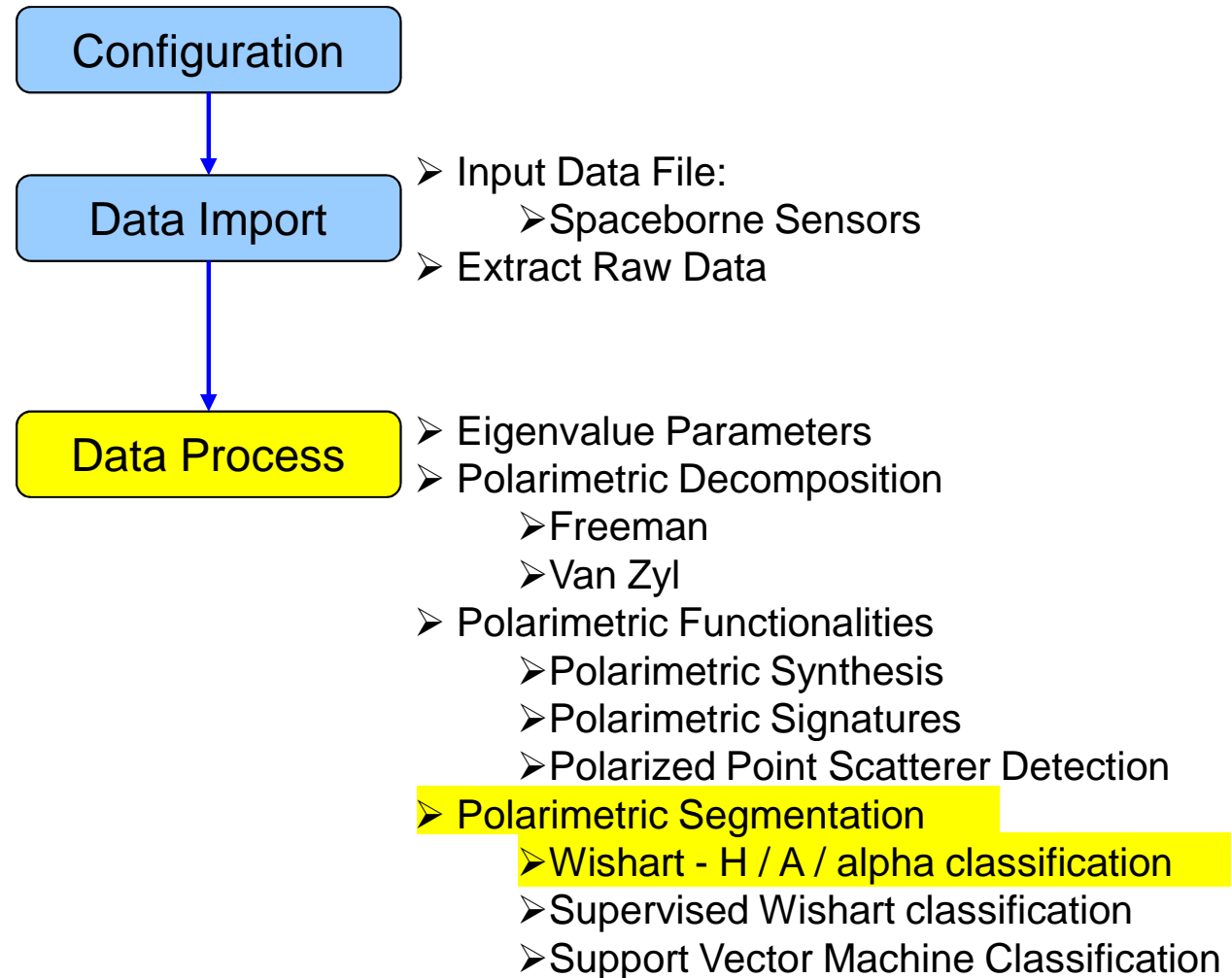
P.P.S Detection
p1 0.6 alpha 1 40

Run ? Exit

PolSARpro v5.0 - Run Trace

Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu





PROCESS DATA



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert **Process** Display Calibration

Linear (+45 / -45)
Circular (L / R)
Elliptical (phi, tau)

Box Car Filter
Box Car - Edge Filter
C. Lopez Filter
Gaussian Filter
IDAN Filter
J.S. Lee Refined Filter
J.S. Lee Sigma Filter
P.W.F Filter
Edge Detector

Decomposition Parameters
Eigenvector Set Parameters
Eigenvalue Set Parameters

JRH : Huynen Decomposition
RMB1 : Barnes 1 Decomposition
RMB2 : Barnes 2 Decomposition
SRC : Cloude Decomposition
WAH1 : Holm 1 Decomposition
WAH2 : Holm 2 Decomposition
HAA : H / A / Alpha Decomposition

FRE2 : Freeman 2 Components Decomposition
FRE3 : Freeman 3 Components Decomposition
VZ3 : Van Zyl 3 Components Decomposition
YAM3 : Yamaguchi 3 Components Decomposition
YAM4 : Yamaguchi 4 Components Decomposition
NEU : Neumann 2 Components Decomposition

KRO : Krogager Decomposition
CAM : Cameron Decomposition
TSVM : Touzi Decomposition

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O.P.C.E
R.C.S Max
Surface Inversion
RVOG PolSAR Inversion
Sub-Aperture Analysis
DEM Estimation
Polarisation Orientation Compensation

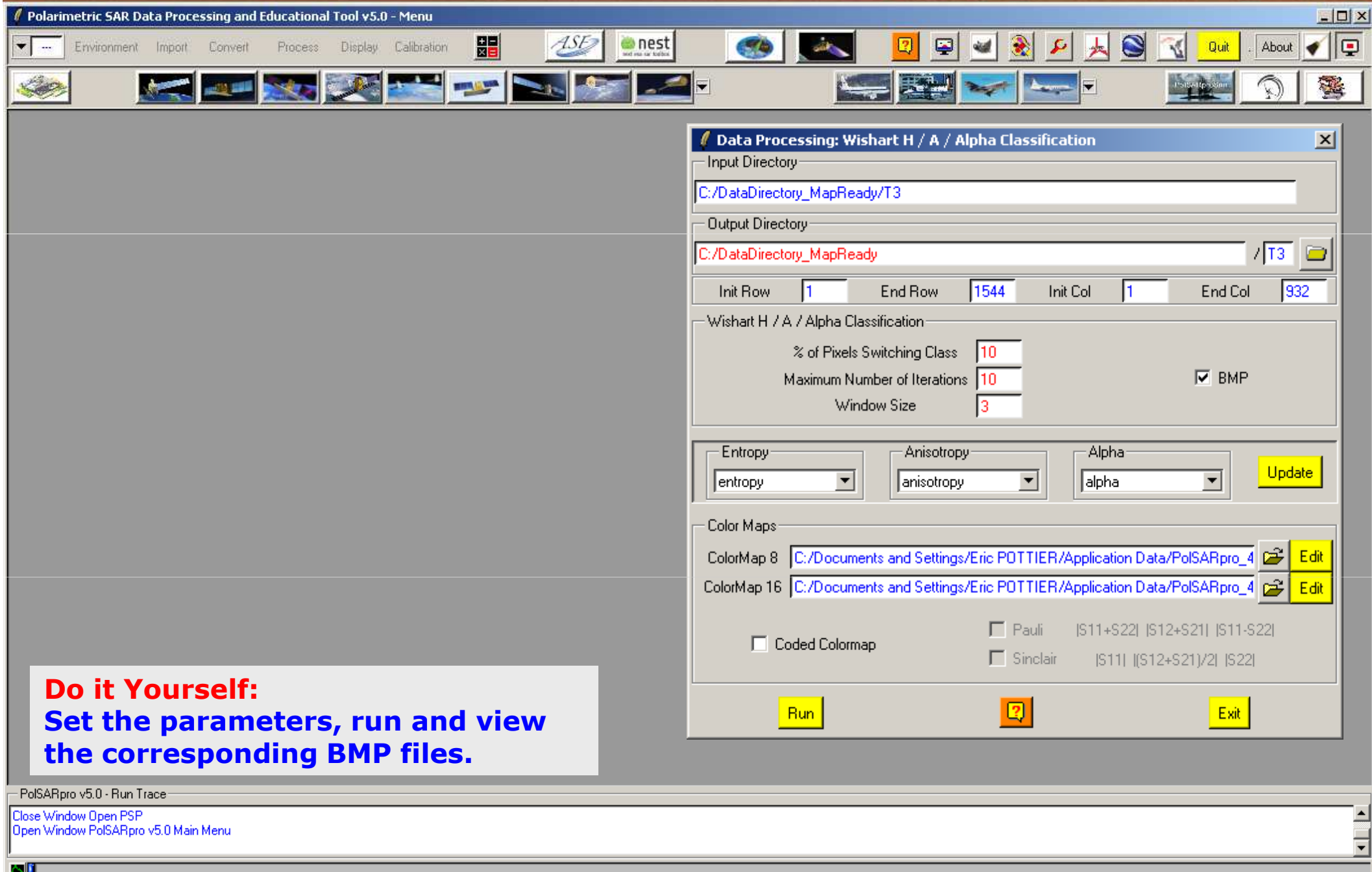
Data Statistics
Data Histograms
Data Profiles
Histogram Based Statistics
Texture Analysis

Clustering Process
Parameter Averaging
Data Sets Averaging

Decomposition Applications

PolSARpro v5.0 - Run Trace
Close Window Open PSP
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WISHART - H/A/alpha CLASSIFICATION



The screenshot shows the PolSARpro v5.0 software interface. The main window is titled "Data Processing: Wishart H / A / Alpha Classification". It contains several input fields and controls:

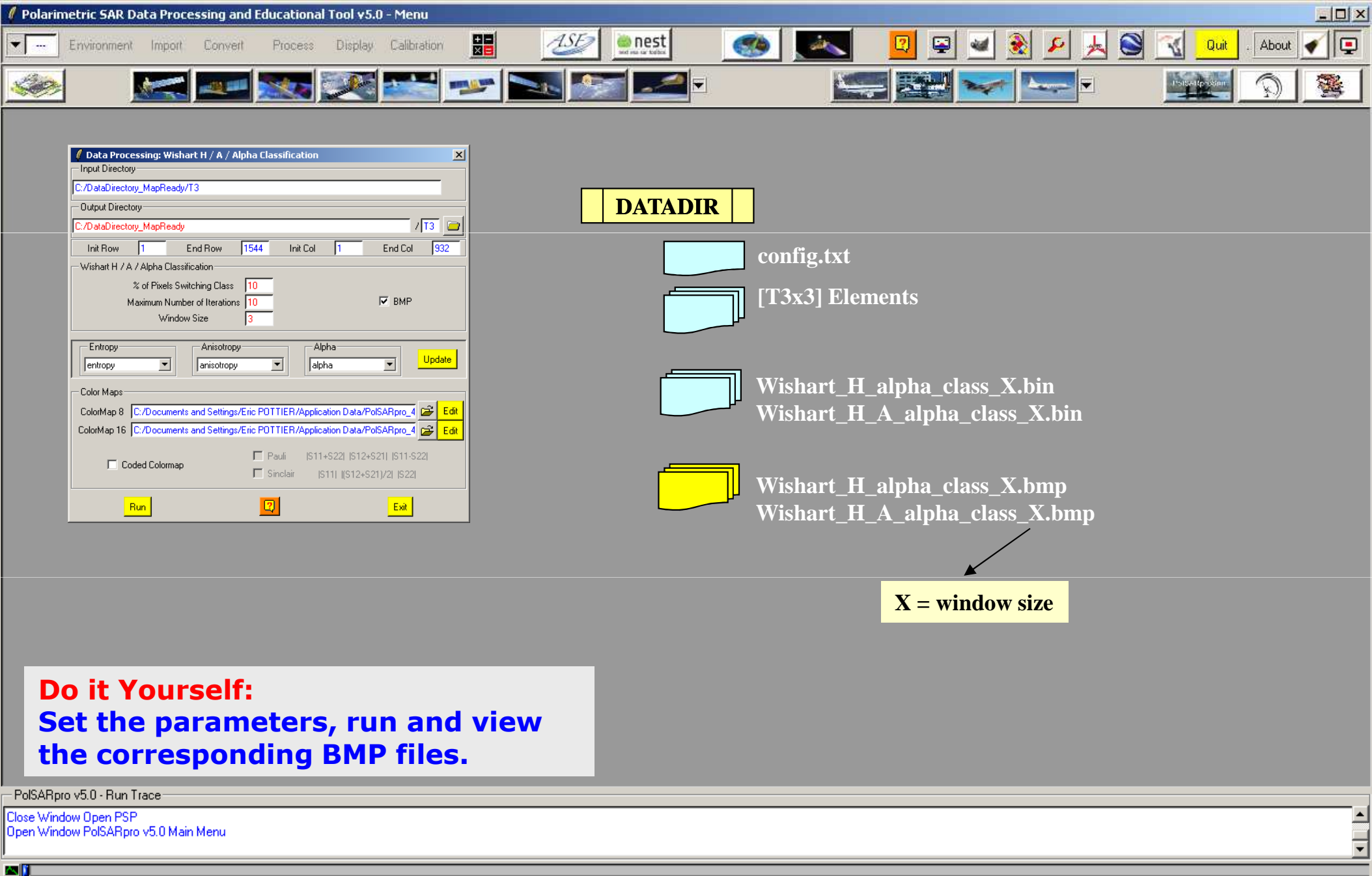
- Input Directory:** C:/DataDirectory_MapReady/T3
- Output Directory:** C:/DataDirectory_MapReady / T3
- Init Row:** 1, **End Row:** 1544, **Init Col:** 1, **End Col:** 932
- Wishart H / A / Alpha Classification:**
 - % of Pixels Switching Class: 10
 - Maximum Number of Iterations: 10
 - Window Size: 3
 - BMP
- Entropy:** entropy (dropdown)
- Anisotropy:** anisotropy (dropdown)
- Alpha:** alpha (dropdown)
- Update** button
- Color Maps:**
 - ColorMap 8: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_4 (Edit)
 - ColorMap 16: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_4 (Edit)
- Coded Colormap
- Pauli |S11+S22| |S12+S21| |S11-S22|
- Sinclair |S11| (|S12+S21|/2) |S22|
- Run**, **Exit**, and **Help** buttons

At the bottom left, there is a "Run Trace" window with the following text:

```
PolSARpro v5.0 - Run Trace
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu
```

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

WISHART - H/A/alpha CLASSIFICATION



The screenshot shows the 'Data Processing: Wishart H / A / Alpha Classification' dialog box in the PolSARpro v5.0 software. The dialog box contains the following fields and options:

- Input Directory: C:/DataDirectory_MapReady/T3
- Output Directory: C:/DataDirectory_MapReady / T3
- Init Row: 1, End Row: 1544, Init Col: 1, End Col: 932
- Wishart H / A / Alpha Classification:
 - % of Pixels Switching Class: 10
 - Maximum Number of Iterations: 10
 - Window Size: 3
 - BMP
- Entropy: entropy, Anisotropy: anisotropy, Alpha: alpha, Update button
- Color Maps:
 - ColorMap 8: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_4 Edit
 - ColorMap 16: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_4 Edit
 - Coded Colormap
 - Pauli |S11+S22| |S12+S21| |S11-S22|
 - Sinclair |S11| |(S12+S21)/2| |S22|
- Run, Exit buttons

Below the dialog box, a list of output files is shown under the heading 'DATADIR':

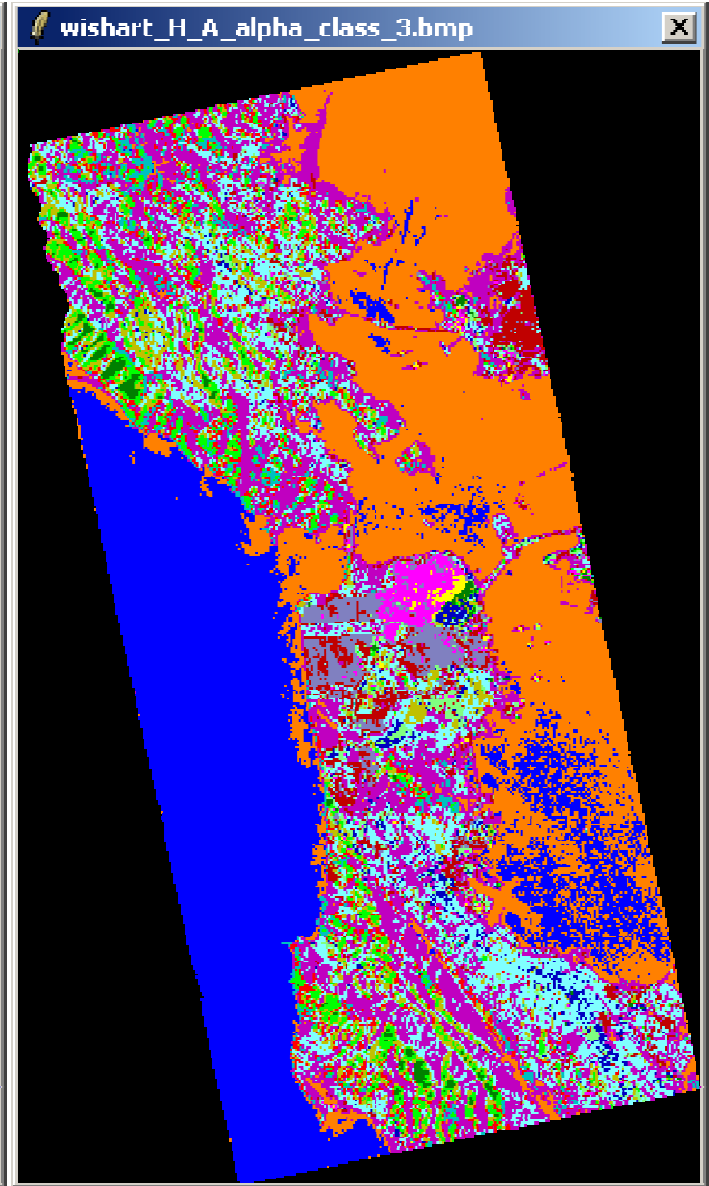
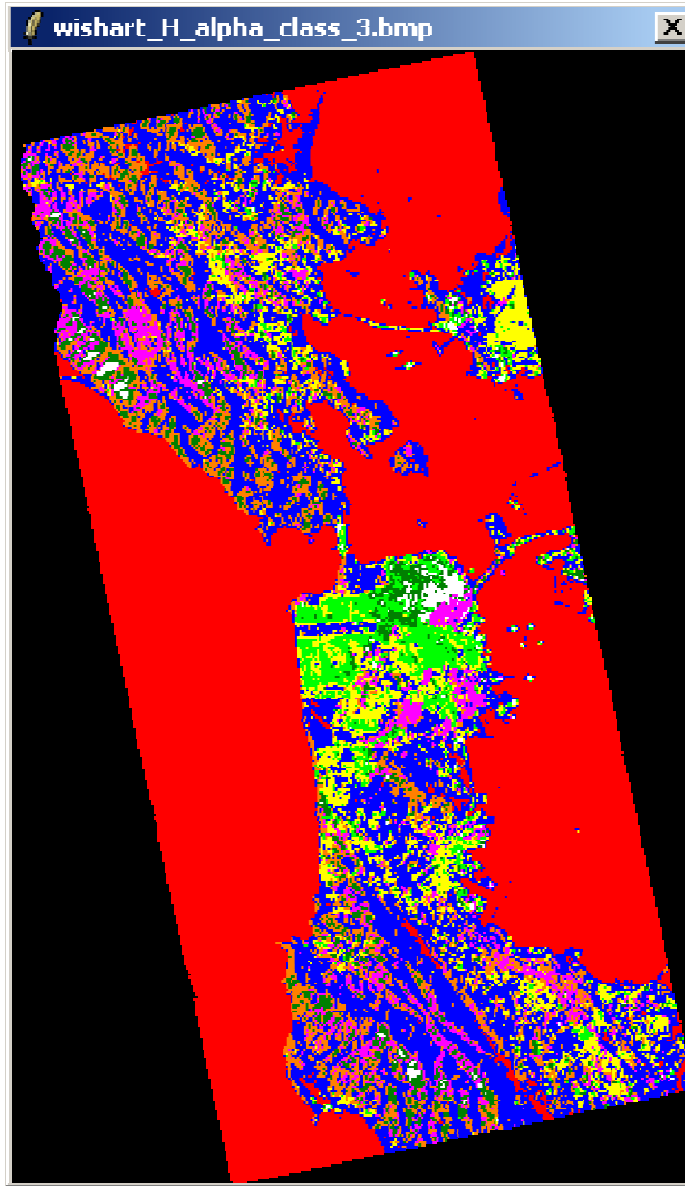
- config.txt
- [T3x3] Elements
- Wishart_H_alpha_class_X.bin
- Wishart_H_A_alpha_class_X.bin
- Wishart_H_alpha_class_X.bmp
- Wishart_H_A_alpha_class_X.bmp

An arrow points from the 'X' in the file names to a box containing the text 'X = window size'.

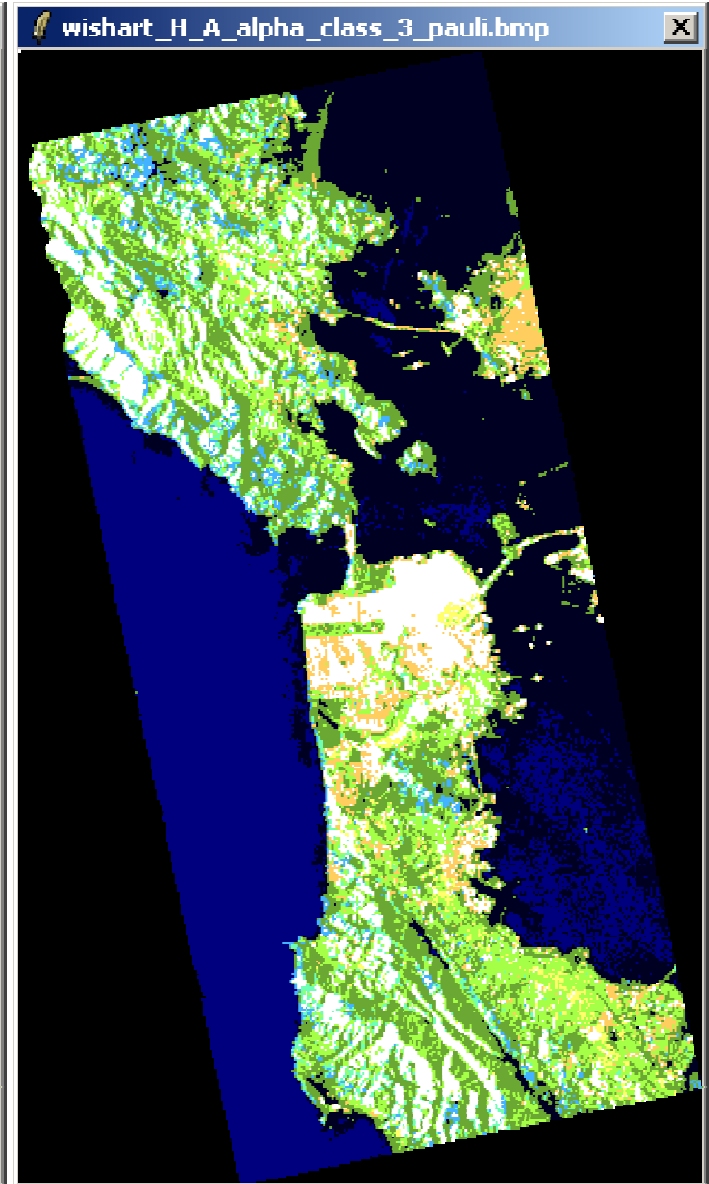
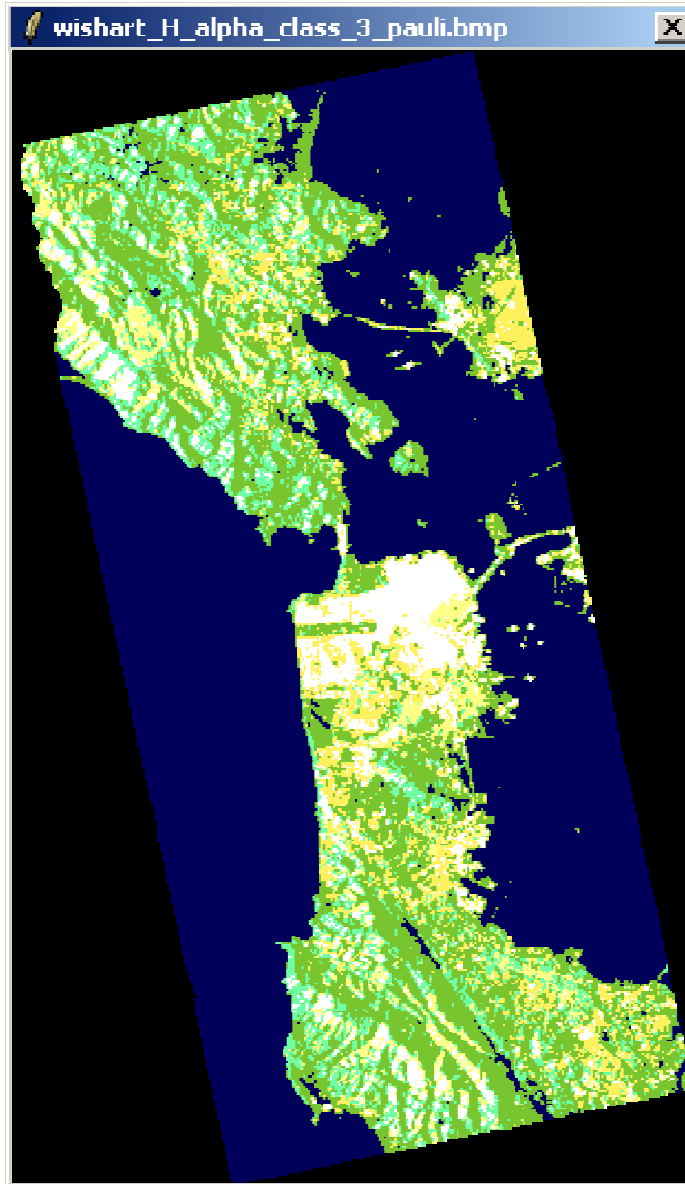
Do it Yourself:
Set the parameters, run and view the corresponding BMP files.

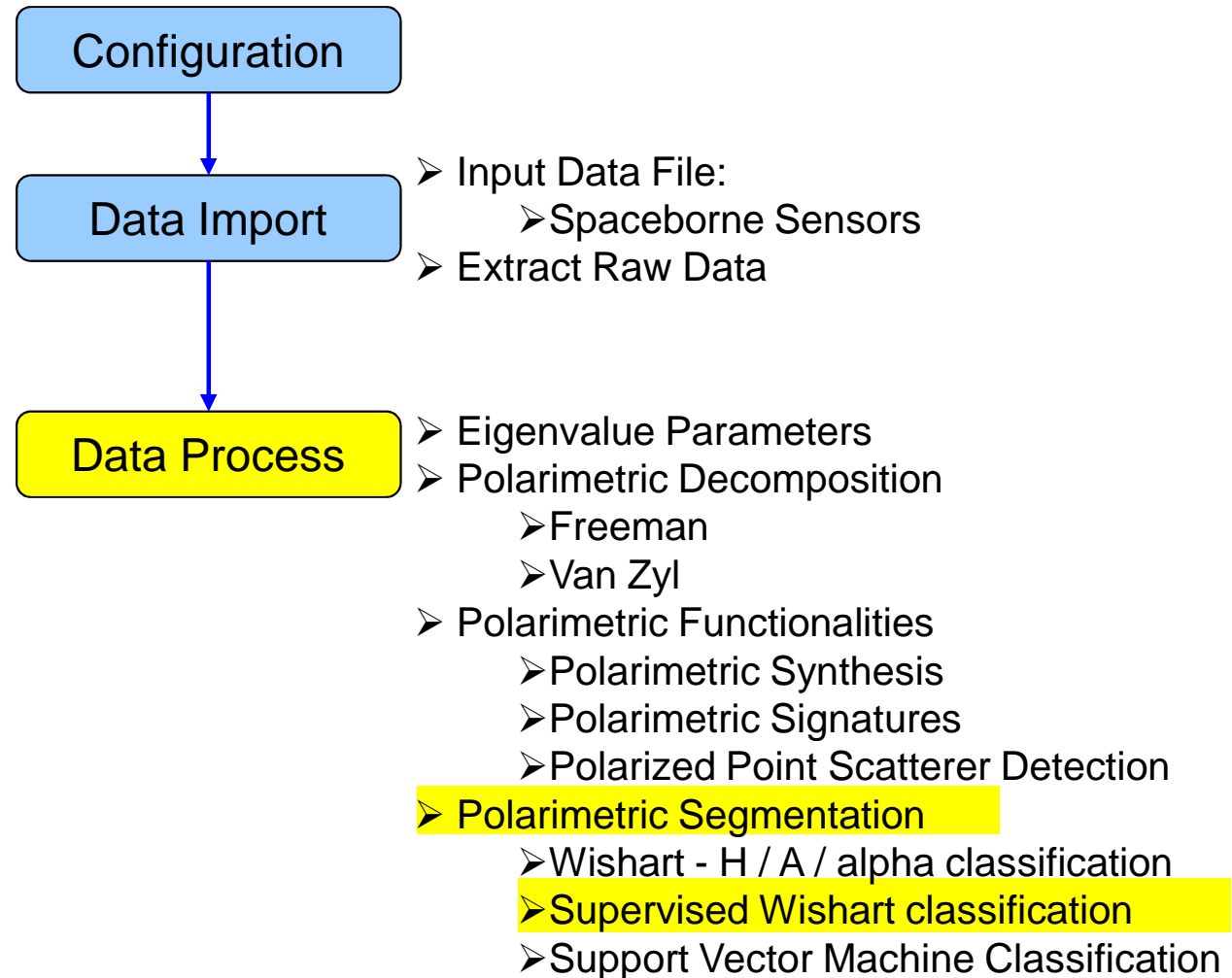
PolSARpro v5.0 - Run Trace
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

WISHART - H/A/alpha CLASSIFICATION



WISHART - H/A/alpha CLASSIFICATION





PROCESS DATA



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert **Process** Display Calibration

Linear (+45 / -45)
Circular (L / R)
Elliptical (phi, tau)

Box Car Filter
Box Car - Edge Filter
C. Lopez Filter
Gaussian Filter
IDAN Filter
J.S. Lee Refined Filter
J.S. Lee Sigma Filter
P.W.F Filter
Edge Detector

Decomposition Parameters
Eigenvector Set Parameters
Eigenvalue Set Parameters

JRH : Huynen Decomposition
RMB1 : Barnes 1 Decomposition
RMB2 : Barnes 2 Decomposition
SRC : Cloude Decomposition
WAH1 : Holm 1 Decomposition
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HAA : H / A / Alpha Decomposition

FRE2 : Freeman 2 Components Decomposition
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Alpha Approximation (Praks & Colin)
Entropy Approximation (Praks & Colin)
Scattering Mechanism Entropy (Freeman)
Scattering Mechanism Entropy (Van Zyl)
Kozlov Anisotropy
Lueneburg Anisotropy
Polarized Point Scatterer Detection
Reflectivity Ratio
Differential Reflectivity (ZDR)

Polarisation Synthesis
Polarimetric Signature
Stokes Parameters
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O.P.C.E
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Texture Analysis

Clustering Process
Parameter Averaging
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Decomposition Applications

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Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

SUPERVISED CLASSIFICATION



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASE nest

Quit About

Data Processing: Wishart Supervised Classification

Input Directory: C:/DataDirectory_MapReady/T3

Output Directory: C:/DataDirectory_MapReady / T3

Init Row: 1 End Row: 1544 Init Col: 1 End Col: 932

FULL-POLSAR SUPERVISED CLASSIFIER

Classification Configuration

BMP Reject Class Confusion Matrix

Window Size: 1 Reject Ratio:

CM Editor CMR Editor

Color Maps

ColorMap 16: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_ Edit

Coded Colormap Pauli |S11+S22| |S12+S21| |S11-S22|

Sinclair |S11| (|S12+S21|/2) |S22|

Training Areas

Areas File: C:/DataDirectory_MapReady/T3/training_areas.txt

Graphic Editor Text Editor Run Training Process

Set File: C:/DataDirectory_MapReady/T3/training_cluster_centers.bin

Run Exit

Training Area...

Class: 1

New Del

Area: 1

New Del

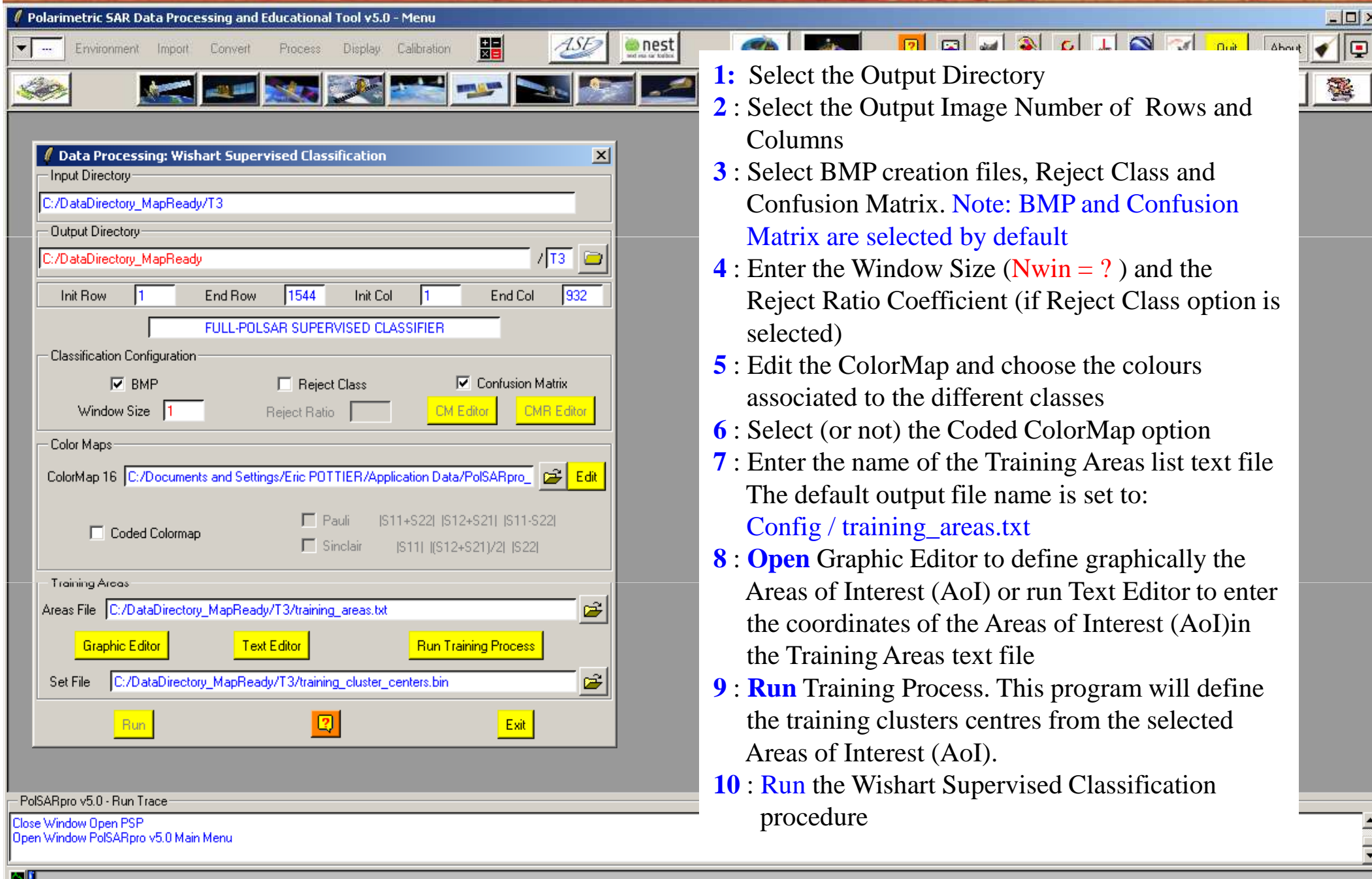
Clear Reset

Save Exit

PolSARpro v5.0 - Run Trace

Close Window Open PSP

Open Window PolSARpro v5.0 Main Menu



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 ($N_{win} = ?$) 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](#)

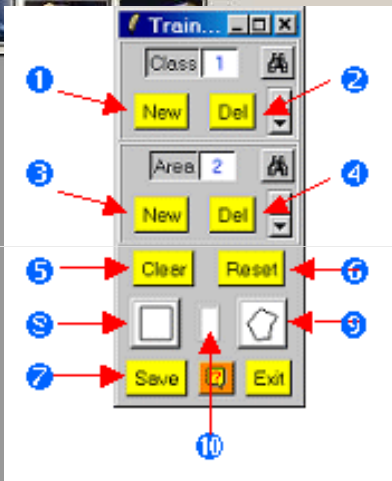
8: **Open** Graphic Editor to define graphically the Areas of Interest (AoI) or run Text Editor to enter the coordinates of the Areas of Interest (AoI) in the Training Areas text file





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

Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration ASE nest



- **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.

PolSARpro v5.0 - Run Trace

Close Window Open PSP
Open Window PolSARpro v5.0 Main Men

SUPERVISED CLASSIFICATION



PolSARpro v5.0 - Menu

Environment Import Convert Process Display Calibration

PauliRGB.bmp

Data Processing: Wishart Supervised Classification

Input Directory: C:/DataDirectory_MapReady/T3

Output Directory: C:/DataDirectory_MapReady /T3

Init How: 1 End How: T544 Init Lol: 1 End Lol: 932

FULL-POLSAR SUPERVISED CLASSIFIER

Classification Configuration

BMP Reject Class Confusion Matrix

Window Size: 1 Reject Ratio: CM Editor CMR Editor

Color Maps

ColorMap 16: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_ Edit

Coded Colormap Pauli IS11+S22 IS12+S21 IS11-S22

Sinclair IS11 IS12+S21/2 IS22

Training Areas

Areas File: C:/DataDirectory_MapReady/T3/training_areas.txt

Graphic Editor Text Editor Run Training Process

Set File: C:/DataDirectory_MapReady/T3/training_cluster_centers.bin

Run Exit

Training Area...

Class 1

New Del

Area 1

New Del

Clear Reset

Save Exit

PolSARpro v5.0 - Run Trace

Close Window Open PSP

Open Window PolSARpro v5.0 Main Menu

SUPERVISED CLASSIFICATION



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASE nest

Quit About

Data Processing: Wishart Supervised Classification

Input Directory: C:/DataDirectory_MapReady/T3

Output Directory: C:/DataDirectory_MapReady /T3

Init Row: 1 End Row: 1544 Init Col: 1 End Col: 932

FULL-POLSAR SUPERVISED CLASSIFIER

Classification Configuration

BMP Reject Class Confusion Matrix

Window Size: 1 Reject Ratio:

CM Editor CMR Editor

Color Maps

ColorMap 16: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro/

Coded Colormap Pauli IS11+S22 IS12+S21 IS11-S22 Sinclair IS11 IS12+S21/2 IS22

Training Areas

Areas File: C:/DataDirectory_MapReady/T3/training_areas.txt

Graphic Editor Text Editor Run Training Process

Set File: C:/DataDirectory_MapReady/T3/training_cluster_centers.bin

Run Exit

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

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

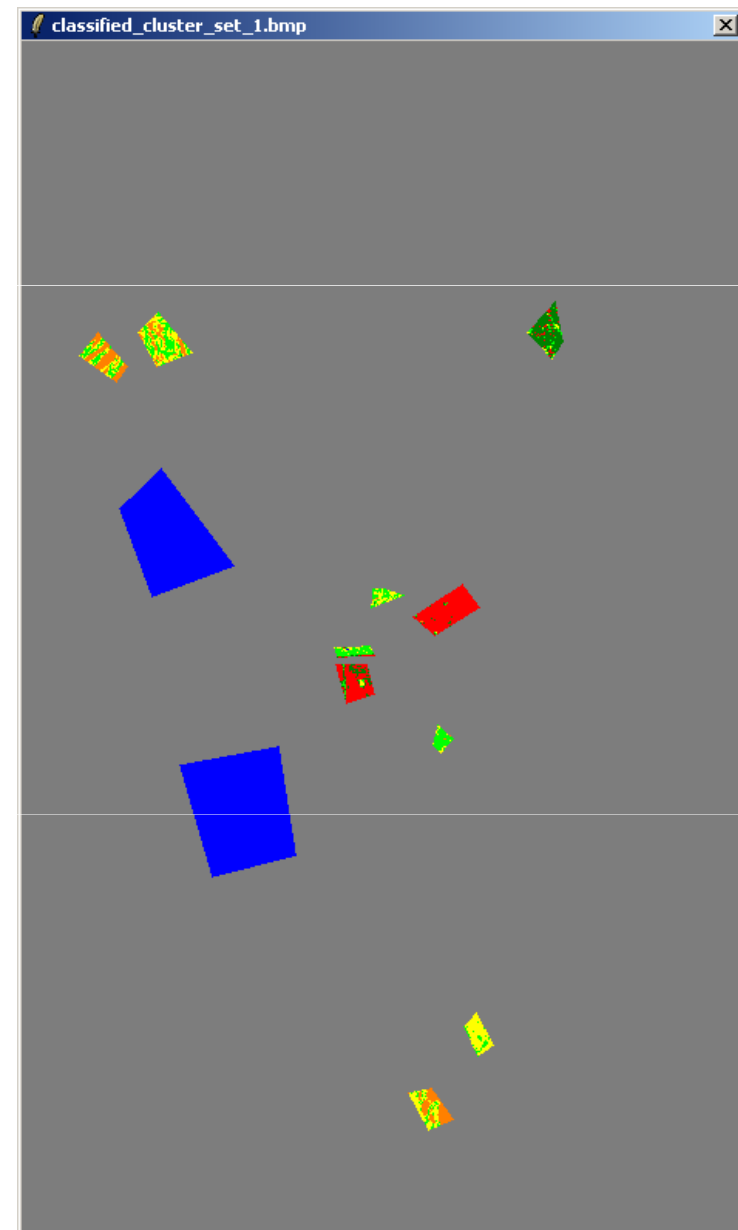
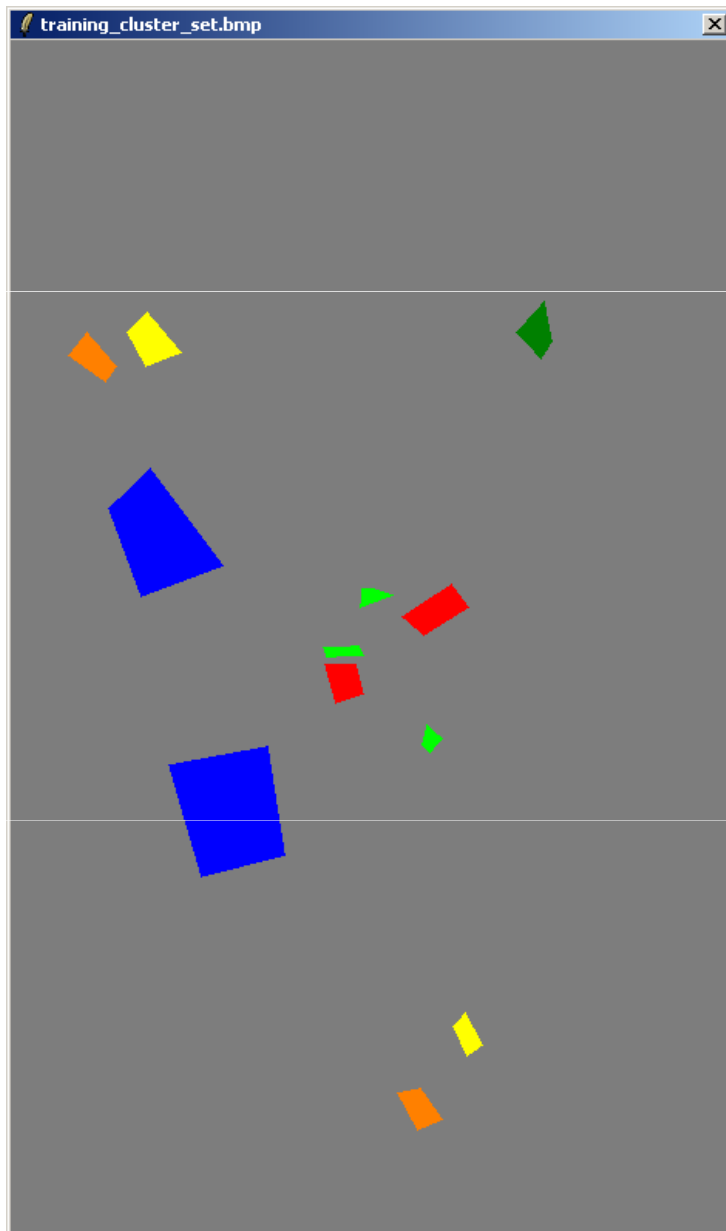
Supervised_class_X.bmp
Supervised_class_rej_X.bmp
Classified_cluster_set.bmp
Classified_cluster_set_rej.bmp

PolSARpro v5.0 - Run Trace

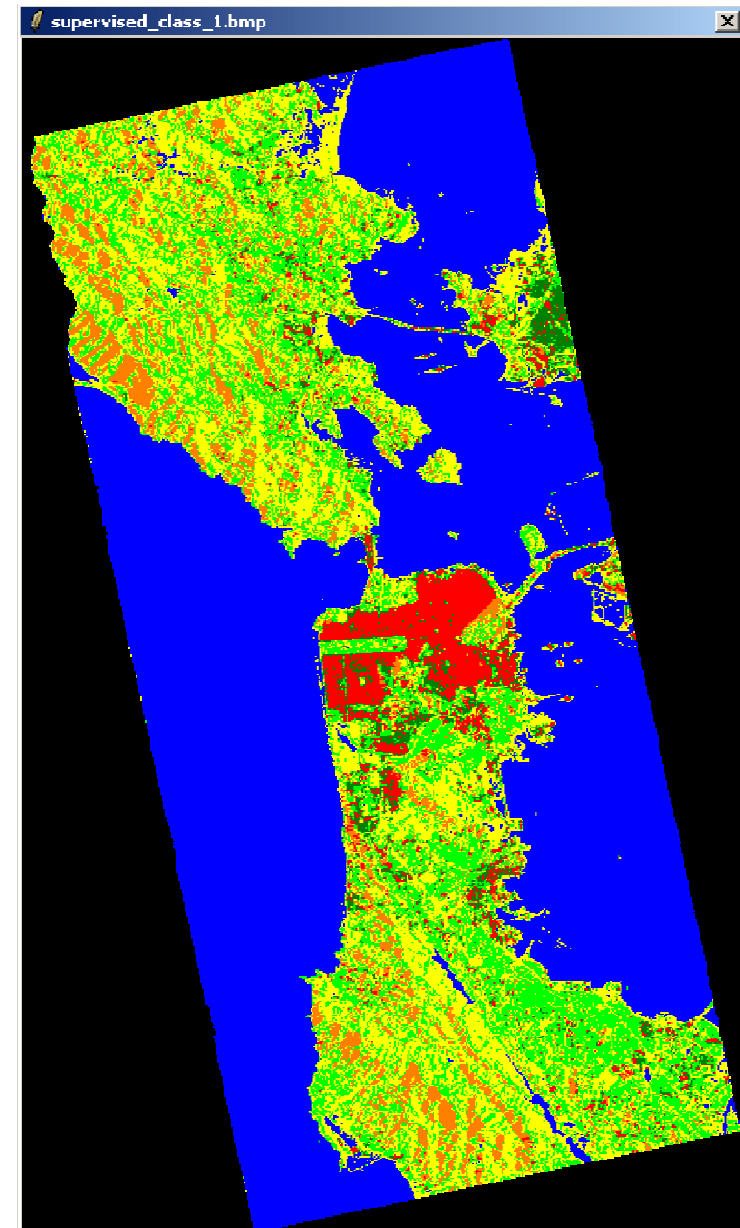
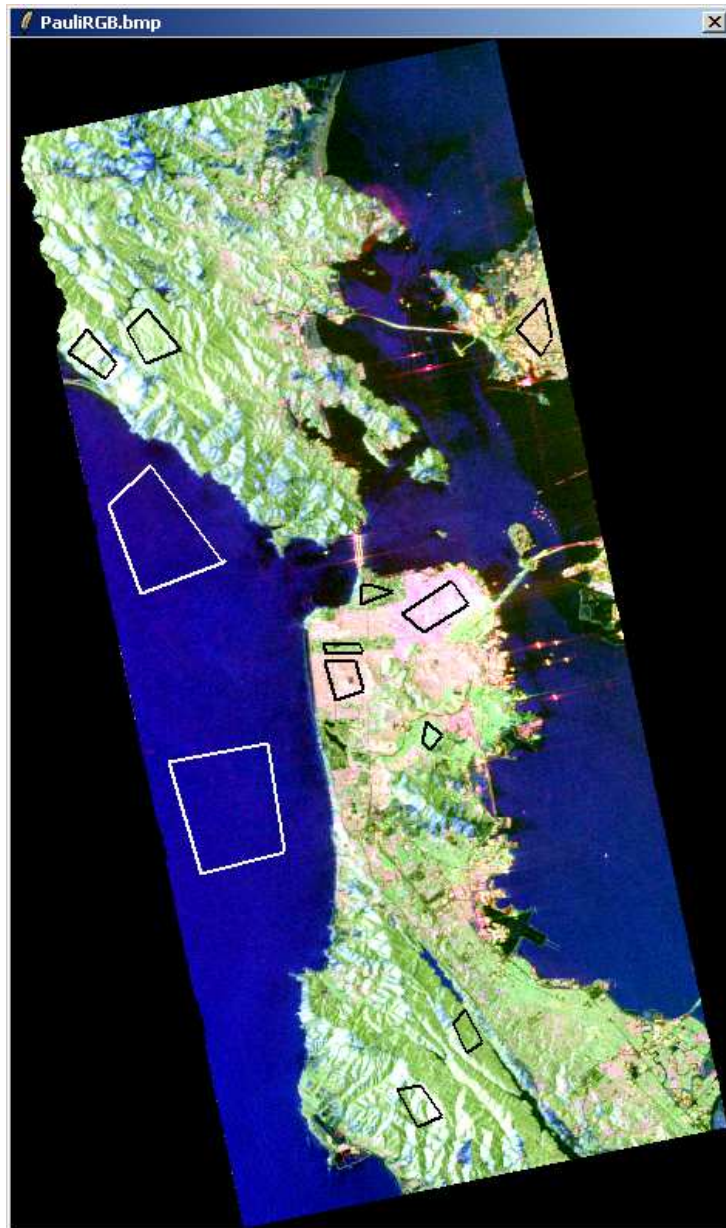
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

X = window size

SUPERVISED CLASSIFICATION



SUPERVISED CLASSIFICATION



SUPERVISED CLASSIFICATION



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASE nest

Quit About

Data Processing: Wishart Supervised Classification

Input Directory: C:/DataDirectory_MapReady/T3

Output Directory: C:/DataDirectory_MapReady / T3

Init Row: 1 End Row: 1544 Init Col: 1 End Col: 932

Update the ColorMap

Classification Configuration

BMP Reject Class Confusion Matrix

Window Size: 1 Reject Ratio: 0.0

CM Editor **CM Editor**

Color Maps

ColorMap 16: C:/Documents and Settings/Eric POTTIER/Application Data/PolSARpro_ Edit

Coded Colormap Pauli |S11+S22| |S12+S21| |S11-S22| Sinclair |S11| (|S12+S21|/2) |S22|

Training Areas

Areas File: C:/DataDirectory_MapReady/T3/training_areas.txt

Graphic Editor Text Editor Run Training Process

Set File: C:/DataDirectory_MapReady/T3/training_cluster_centers.bin

Run ? Exit

C:/DataDirectory_MapReady/T3/confusion_matrix_1.txt

Wrap Text Mode Exit

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

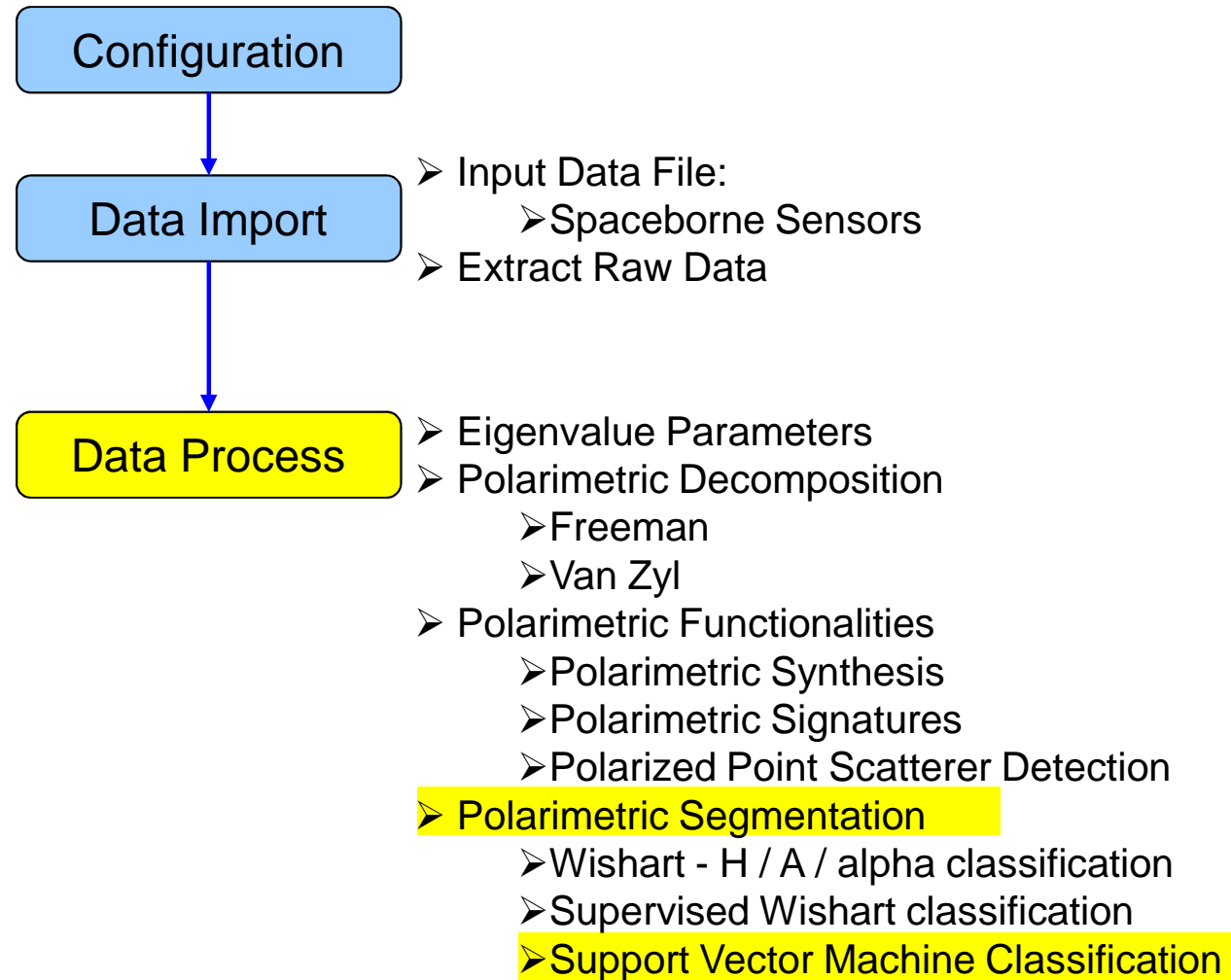
	C1	C2	C3	C4	C5	C6
C1	100.00	0.00	0.00	0.00	0.00	0.00
C2	0.00	88.06	1.98	0.93	0.15	8.88
C3	0.45	3.17	67.52	24.89	1.19	2.78
C4	0.00	0.00	29.38	55.13	15.29	0.19
C5	0.00	0.00	19.16	30.21	50.62	0.00
C6	0.00	9.44	12.56	4.33	0.17	73.50

Class populations

C1	31012
C2	4539
C3	1764
C4	3662
C5	3601
C6	1800

PolSARpro v5.0 - Run Trace

Close Window Open PSP
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PROCESS DATA



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert **Process** Display Calibration

Linear (+45 / -45)
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Elliptical (phi, tau)

Box Car Filter
Box Car - Edge Filter
C. Lopez Filter
Gaussian Filter
IDAN Filter
J.S. Lee Refined Filter
J.S. Lee Sigma Filter
P.W.F Filter
Edge Detector

Decomposition Parameters
Eigenvector Set Parameters
Eigenvalue Set Parameters

JRH : Huynen Decomposition
RMB1 : Barnes 1 Decomposition
RMB2 : Barnes 2 Decomposition
SRC : Cloude Decomposition
WAH1 : Holm 1 Decomposition
WAH2 : Holm 2 Decomposition
HAA : H / A / Alpha Decomposition

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FRE3 : Freeman 3 Components Decomposition
VZ3 : Van Zyl 3 Components Decomposition
YAM3 : Yamaguchi 3 Components Decomposition
YAM4 : Yamaguchi 4 Components Decomposition
NEU : Neumann 2 Components Decomposition

KRO : Krogager Decomposition
CAM : Cameron Decomposition
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H / A / Alpha - Wishart Classification
Fuzzy - H / Alpha Classification
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Faraday Rotation Estimation
Conformity Coefficient
Scattering Predominance
Scattering Diversity
Degree of Purity
Depolarisation Index
Alpha Approximation (Praks & Colin)
Entropy Approximation (Praks & Colin)
Scattering Mechanism Entropy (Freeman)
Scattering Mechanism Entropy (Van Zyl)
Kozlov Anisotropy
Lueneburg Anisotropy
Polarized Point Scatterer Detection
Reflectivity Ratio
Differential Reflectivity (ZDR)

Polarisation Synthesis
Polarimetric Signature
Stokes Parameters
Compact Polarimetric Mode
O.P.C.E
R.C.S Max
Surface Inversion
RVOG PolSAR Inversion
Sub-Aperture Analysis
DEM Estimation
Polarisation Orientation Compensation

Decomposition Applications

PolSARpro v5.0 - Run Trace
Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

SUPPORT VECTOR MACHINE CLASSIFICATION



Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASPE nest

Quit About

PauliRGB.bmp

Data Processing: SVM Supervised Classification

Input Directory: D:/SAN_FRANCISCO_ALOS_MapReady/T3

Output Directory: D:/SAN_FRANCISCO_ALOS_MapReady / T3

Init Row: 1 End Row: 1544 Init Col: 1 End Col: 928

Step 1 - Training Areas

Areas File: Config/svm_training_areas.txt

Graphic Editor (circled)
Text Editor

Step 2 - Classification Configuration

BMP Confusion Matrix CM Editor

Step 3 - Color Maps

ColorMap 16: C:/Users/epottier/AppData/Roaming/PolSARpro_5.0.0/ColorMap/Supervised_ColorMap16.pal Edit

Coded Colormap Pauli |S11+S22| |S12+S21| |S11-S22|
 Sinclair |S11| (|S12+S21|)/2 |S22|

Step 4 - SVM Parameter Setting

Input Polarimetric Indicators: T3 Other Select

Sampling option: Training sampling 500 If important unbalanced training point

Output SVM parameters: Class Probability BMP Mean Hyperplane Distance BMP Useful but time consuming

Step 5 - Kernel Parameter

Cost: 100 RBF RECOMMENDED Polynomial Linear

Gamma = 1/sigma: 0.44444

Optimisation parameters: Setup and Run

Step 6 - Run Classification

Exit

Close window Open PSP
Open Window PolSARpro v5.0 Main Menu

Training Area...

Class 1

New Del

Area 1

New Del

Clear Reset

Save Exit

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Polarimetric SAR Data Processing and Educational Tool v5.0 - Menu

Environment Import Convert Process Display Calibration

ASPE nest

Quit About

Data Processing: SVM Supervised Classification

Input Directory: D:/SAN_FRANCISCO_ALOS_MapReady/T3

Output Directory: D:/SAN_FRANCISCO_ALOS_MapReady / T3

Init Row: 1 End Row: 1544 Init Col: 1 End Col: 928

Step 1 - Training Areas

Areas File: D:/SAN_FRANCISCO_ALOS_MapReady/T3/svm_training_areas.txt

Step 2 - Classification Configuration

BMP Confusion Matrix

Step 3 - Color Maps

ColorMap 16: C:/Users/epottier/AppData/Roaming/PolSARpro_5.0.0/ColorMap/Supervised_ColorMap16.pal

Coded Colormap Pauli |S11+S22| |S12+S21| |S11-S22|

Sinclair |S11| (|S12+S21|/2) |S22|

Step 4 - SVM Parameter Setting

Input Polarimetric Indicators: T3 Other

Sampling option: Training sampling: 500 If important unbalanced training point

Output SVM parameters: Class Probability Mean Hyperplane Distance

Step 5 - Kernel Parameter

Cost: 16384 RBF Polynomial Linear

Gamma = 1/sigma: 0.5000

RECOMMENDED Optimisation parameters

Step 6 - Run Classification

SVM RBF Kernel Parameters Optimisation (Cross Validation) (Ne répond pas)

Log2(C)	C	Log2(G)	G
Min: 8	256.0	Min: -5	0.03125
Max: 14	16384.0	Max: 0	1.0
Step: 2		Step: 1	

ISO Accuracy: 93.5%, 93.0%, 92.5%, 92.0%, 91.5%, 91.0%

Log₂(γ)

Run RBF Kernel Parameters Optimisation

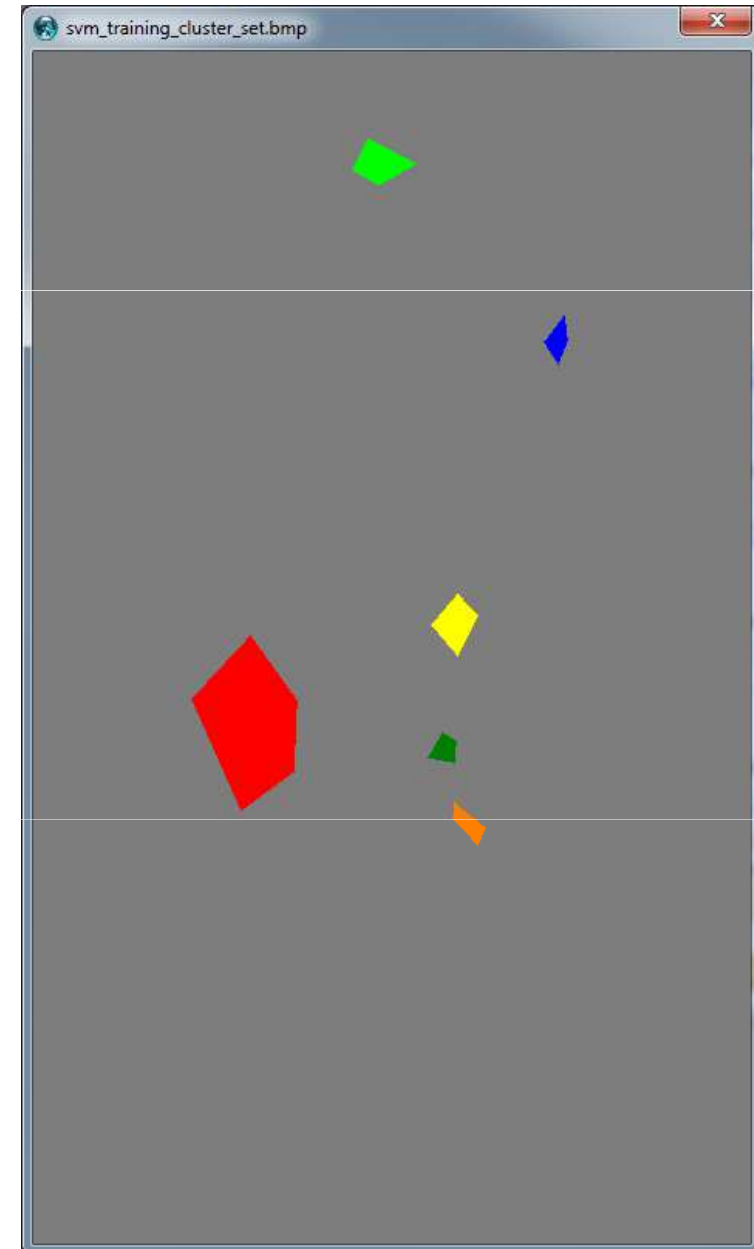
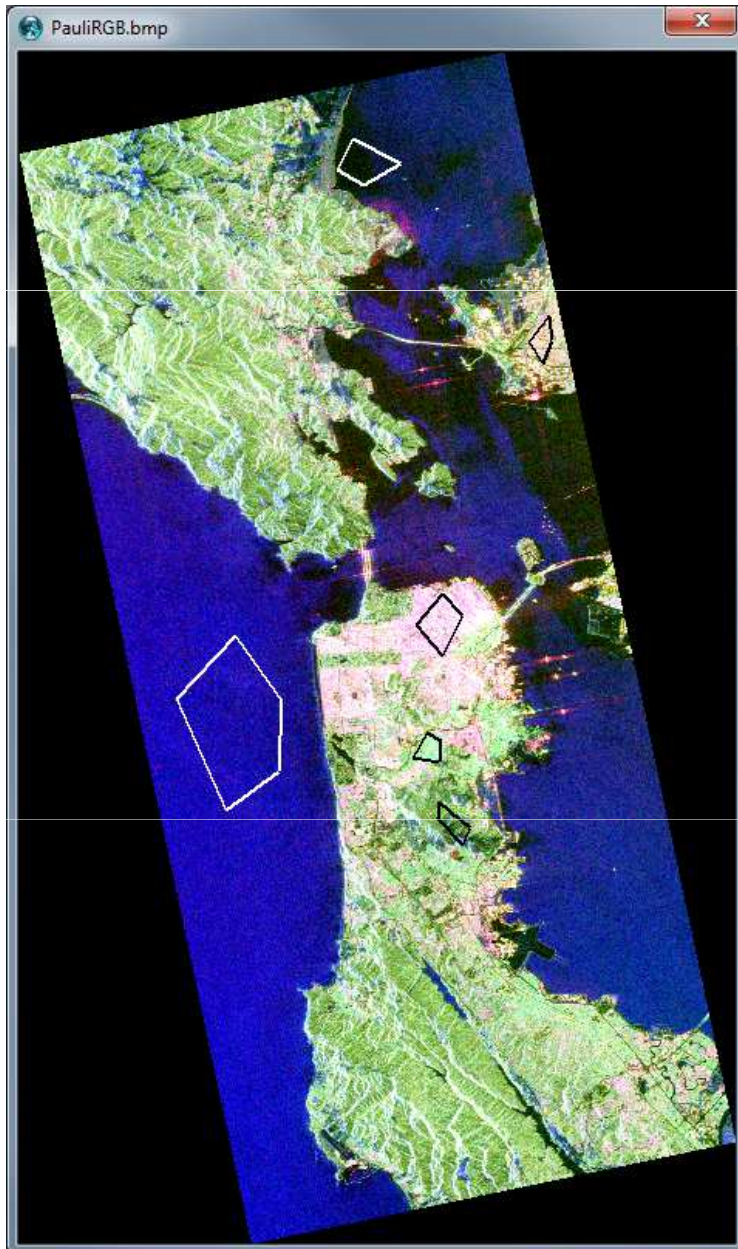
One best couple (C,G)

C: G:

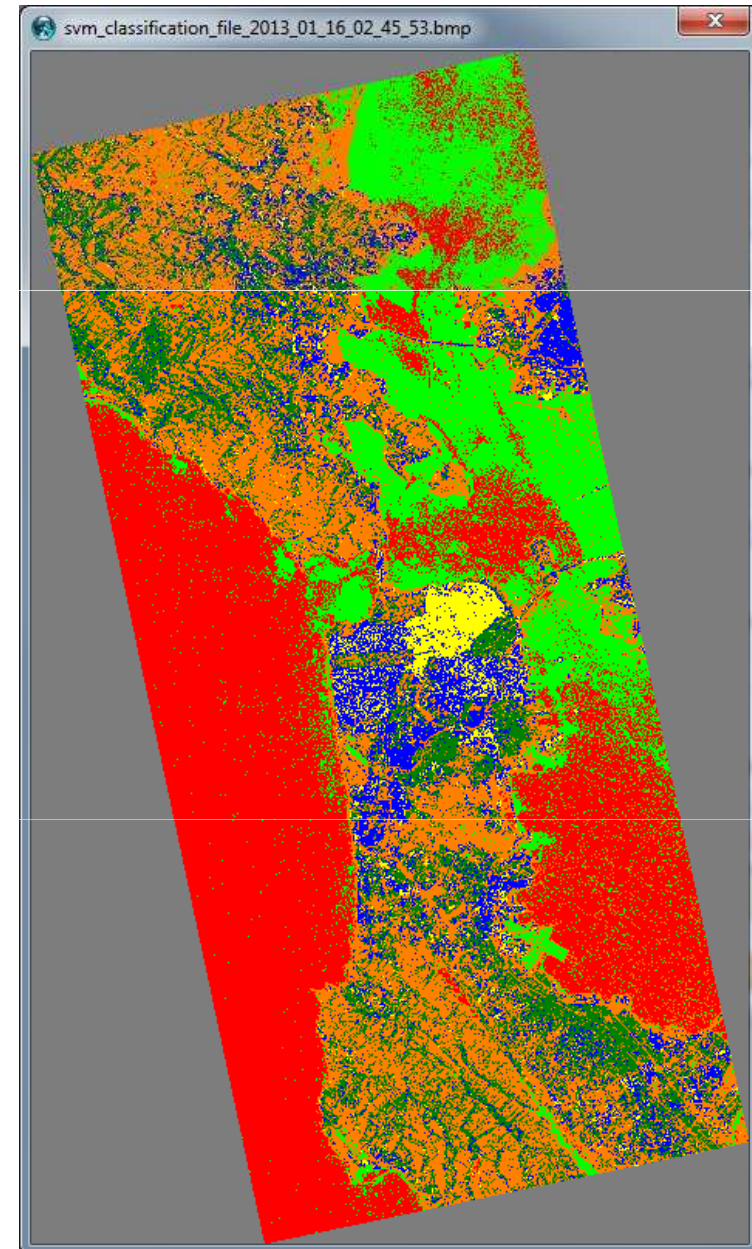
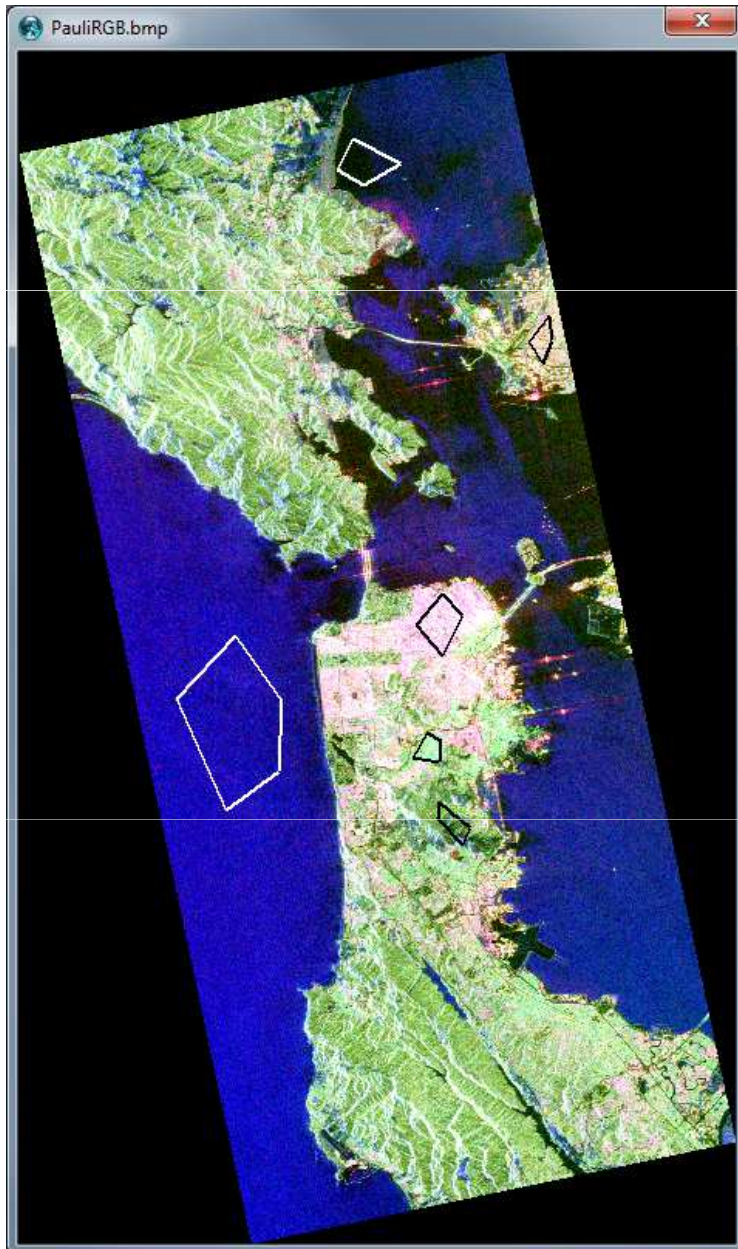
Exit and Save CV Parameters

Close Window Open PSP
Open Window PolSARpro v5.0 Main Menu

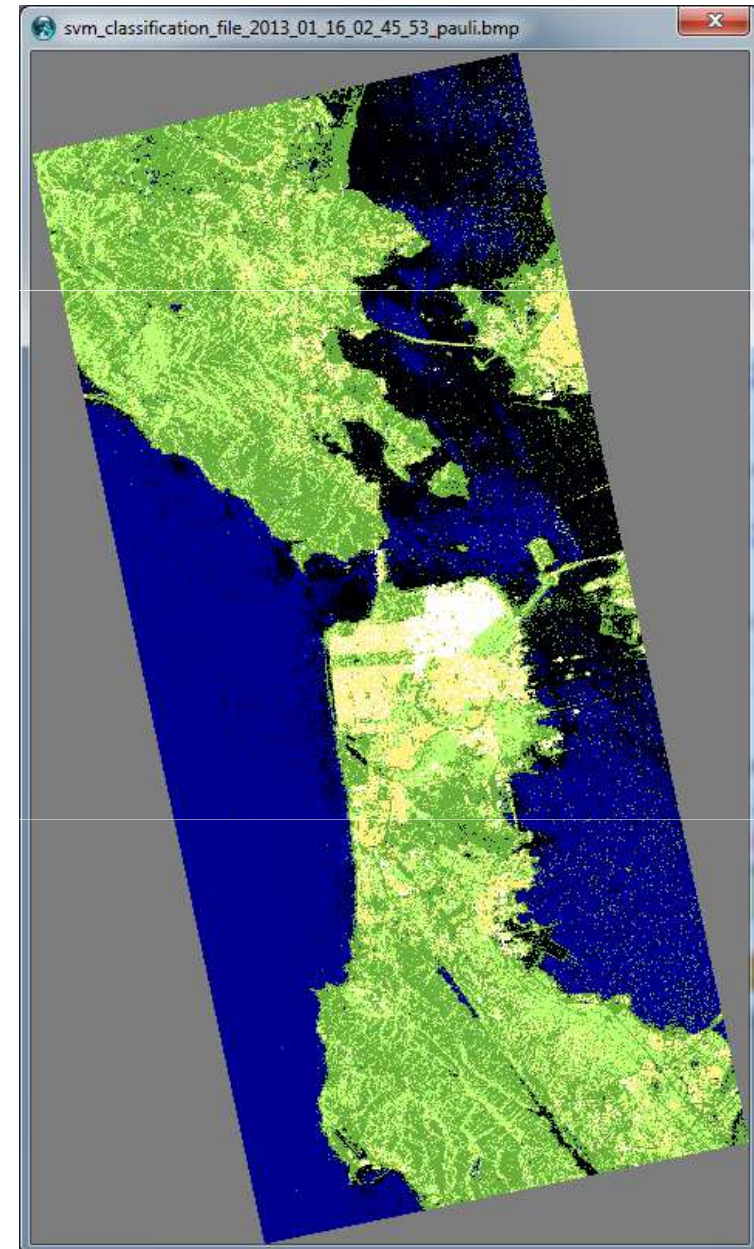
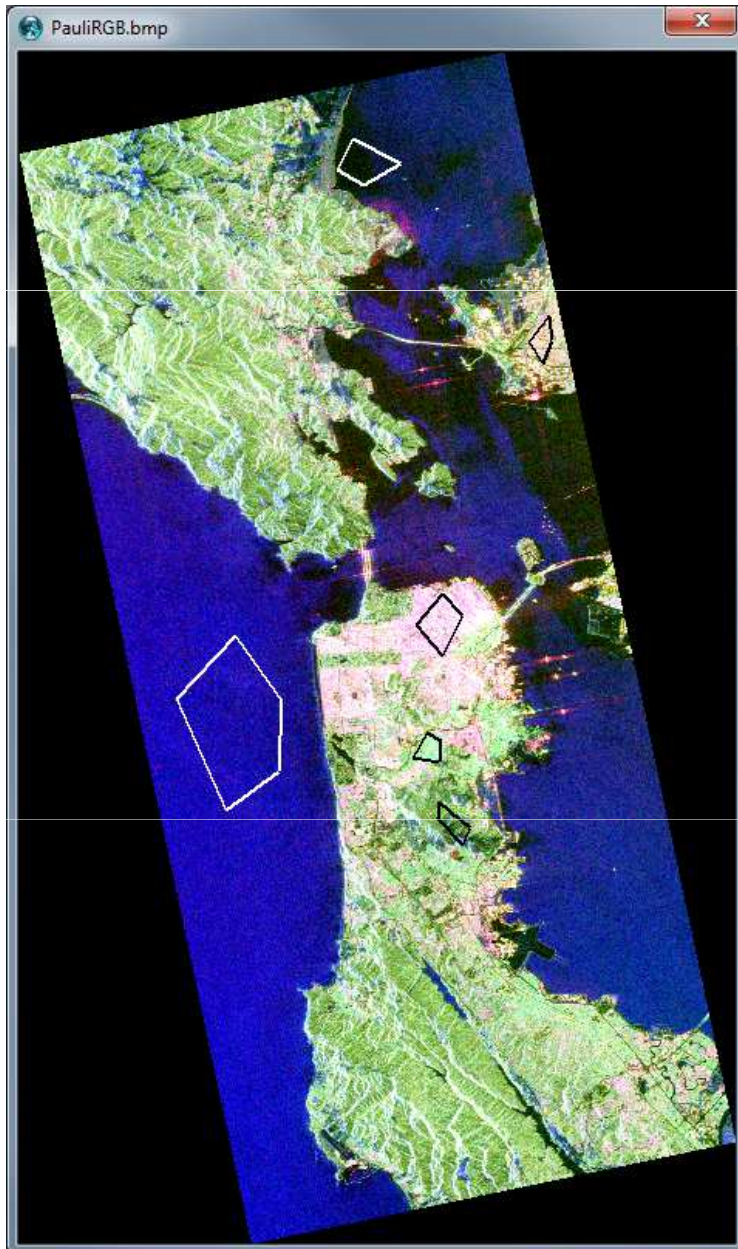
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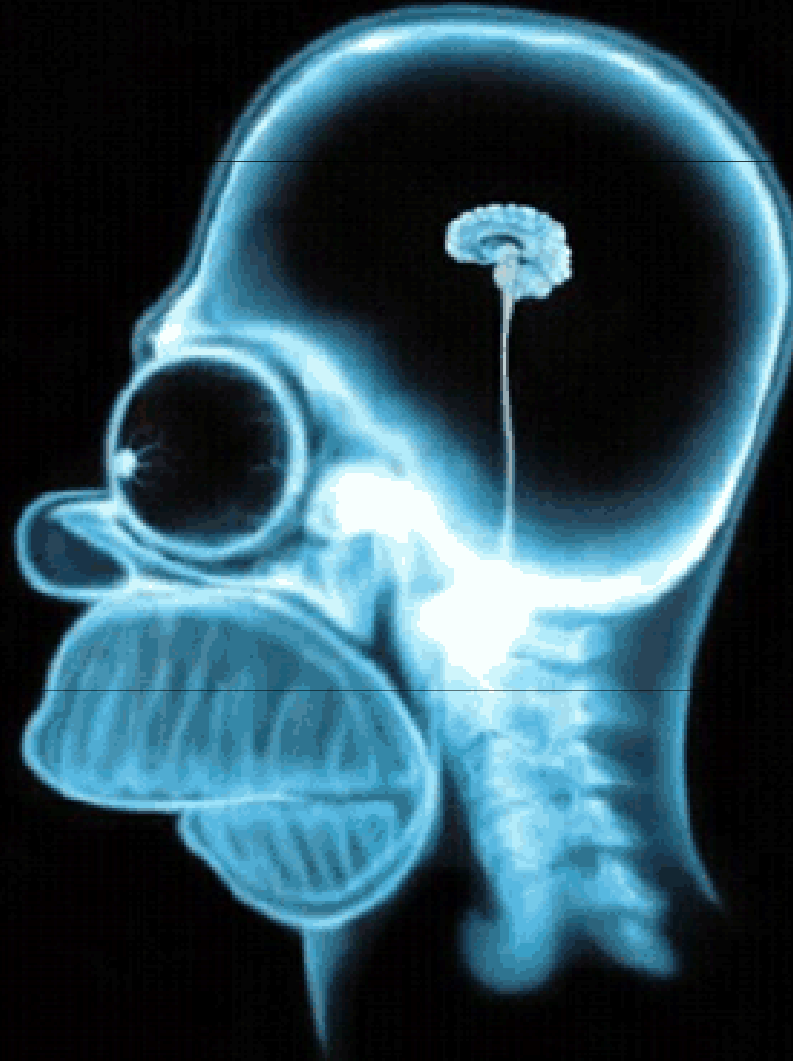


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Questions ?



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