POLSARPRO & Land retrievals using SAR Polarimetry

(Practical Session)

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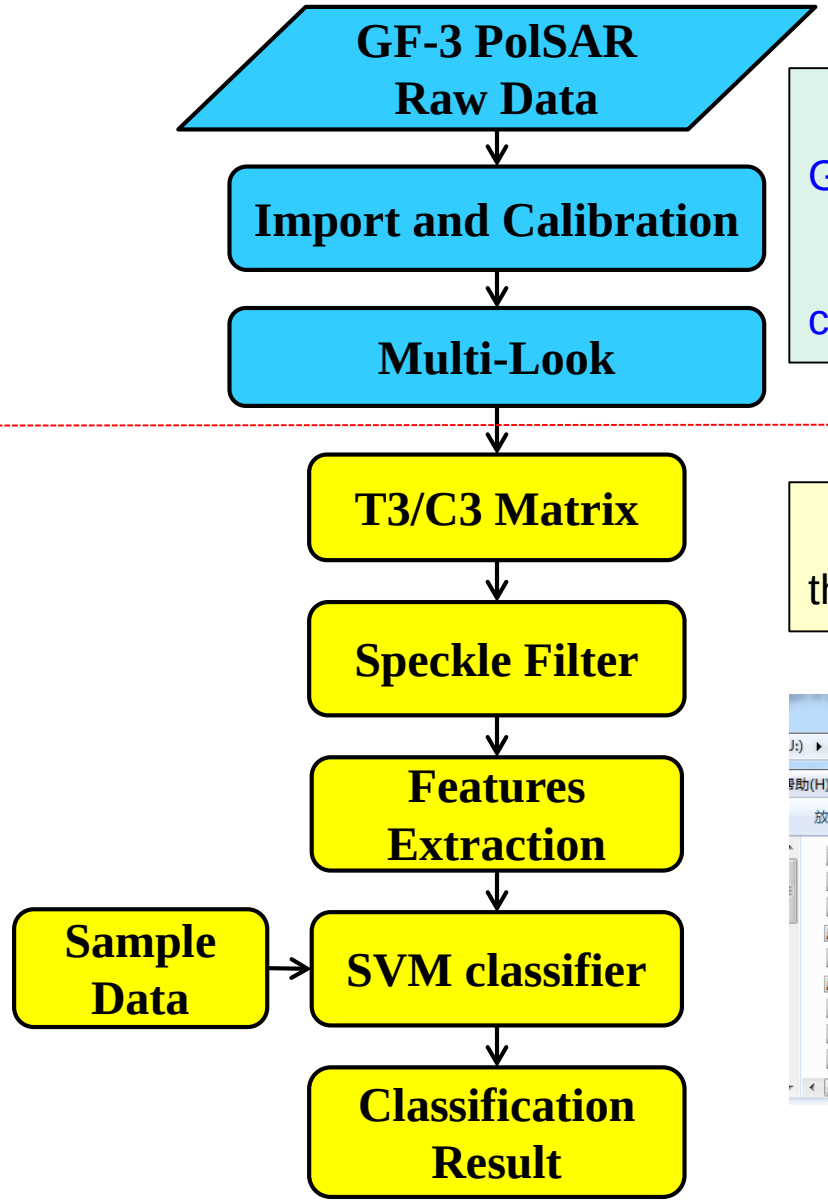
Pol-InSAR Practical
Land cover Classification

Supervised Classification Based on GF-3 PolSAR data

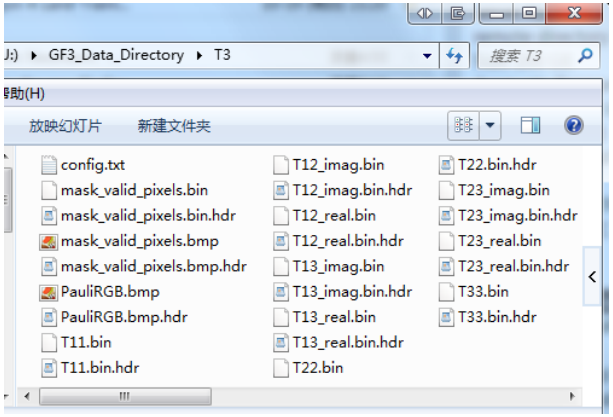
Flow Chart of Classificaiton



PolSARpro 5.1.2 already suports the Improt of GF-3 quad polarization data.

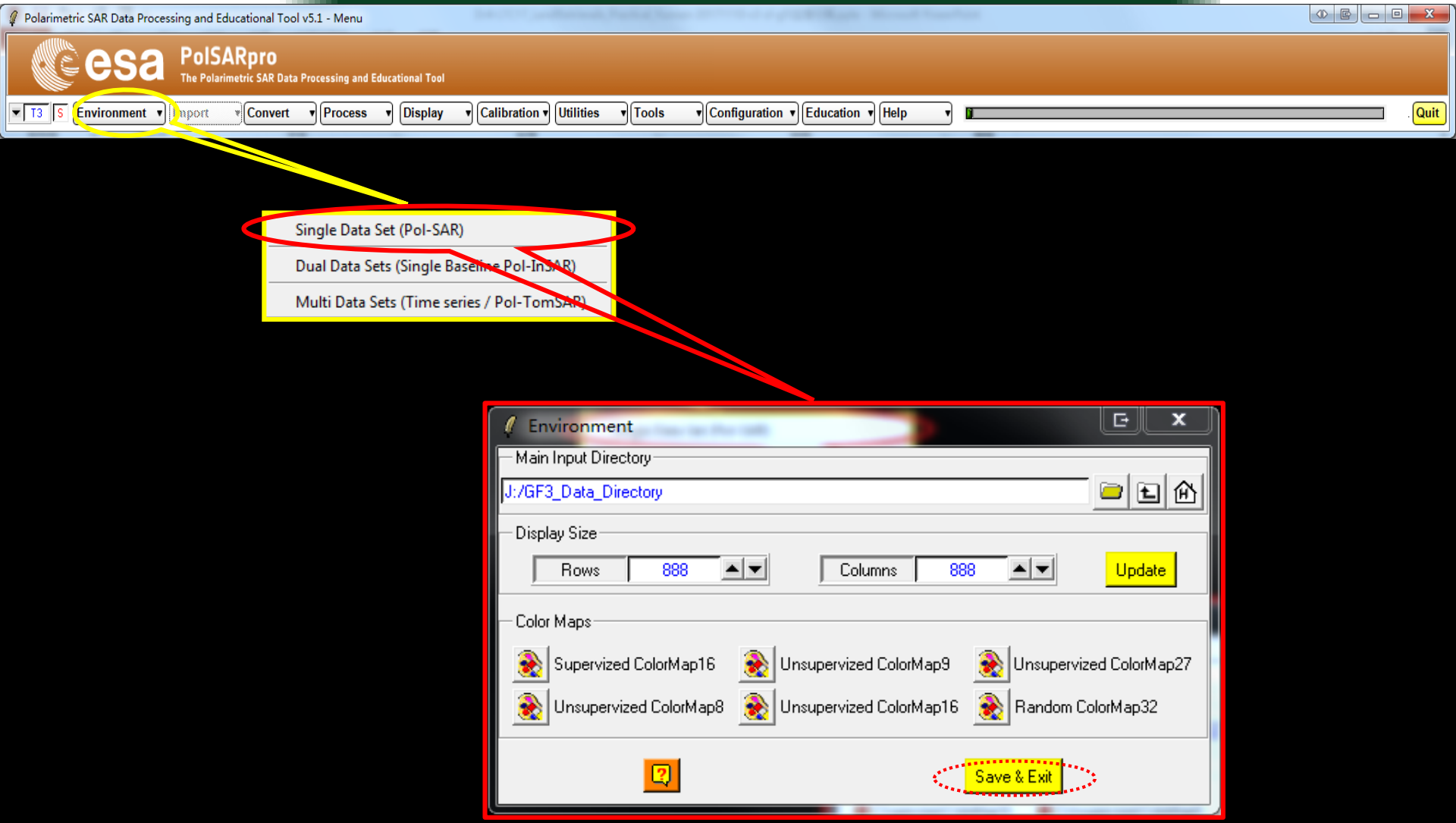
However, the calibration of GF-3 data is not currently supported.

We started this practical session from T3 matrix that has been calibrated and multi-look processed.

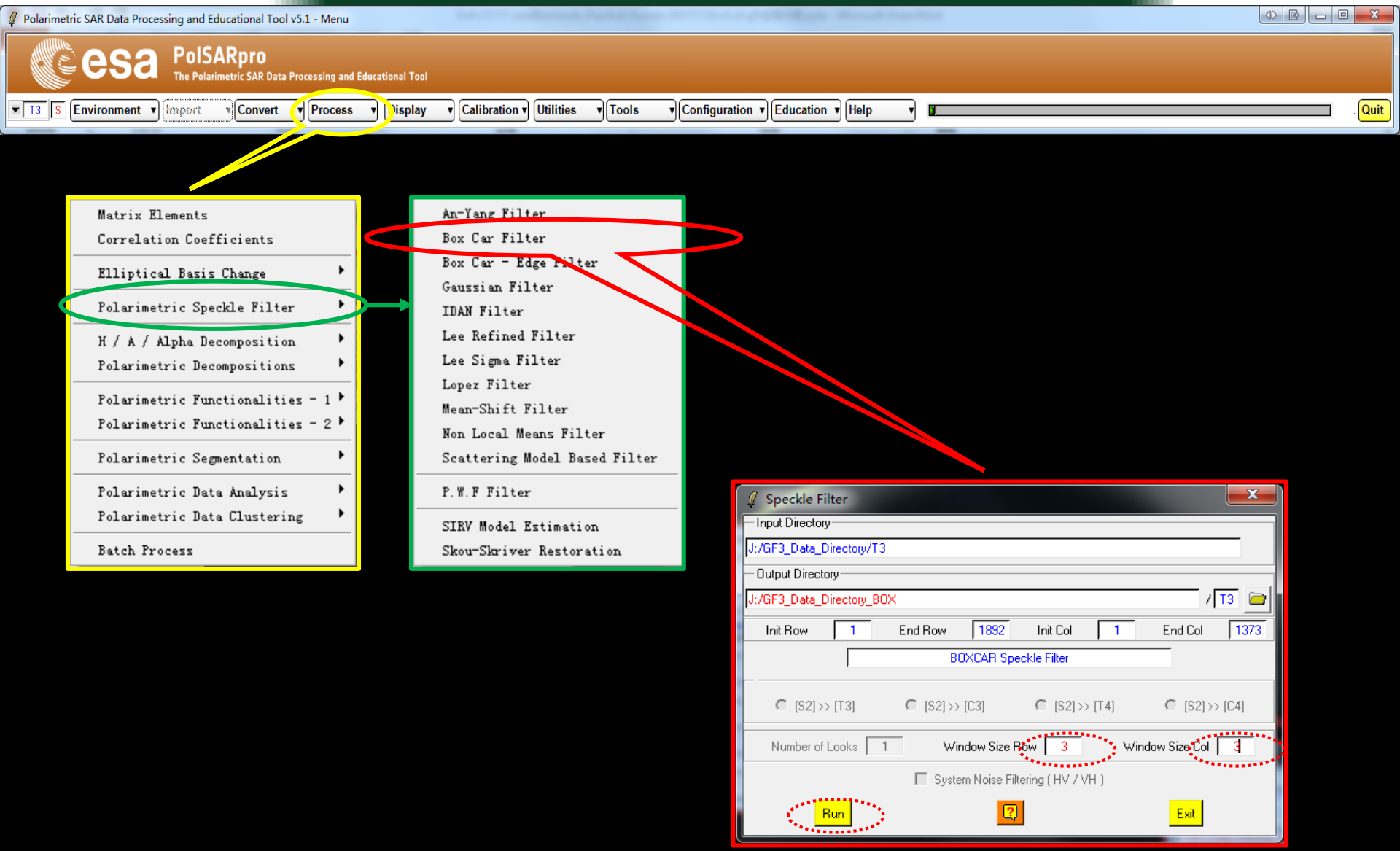


- GF-3 QPSI Quad-Pol
- Range pixel spacing: 9.0 m
- Azimuth pixel spacing: 10.0 m

Step-1: Environment Set



Step-2: Speckle Filter



Step-2: Speckle Filter

Polarimetric SAR Data Processing and Educational Tool v5.1 - Menu

PolSARpro
The Polarimetric SAR Data Processing and Educational Tool

T3 | S | Environment | Import | Convert | Process | Display | Calibration | Utilities | Tools | Configuration | Education | Help | Quit

Display

- Create BMP File
- Create RGB File
- Create HSL File
- Create KML File
- Create Anim GIF File
- Create Gray & Color BMP File
- Create Scatter Plot
- Create Tomogram Display
- Convert BMP File
- Process 1 BMP File
- Display N BMP Files
- SATIM Map Algebra
- Exit

Create RGB File

Input Directory: J:/GF3_Data_Directory_BOX/T3

Output Directory: J:/GF3_Data_Directory_BOX/T3

Init Row 1 | End Row 1892 | Init Col 1 | End Col 1373

1

- (•) Pauli Composition — |S11+S22| |S12+S21| |S11-S22|
- ( ) Sinclair Composition — |S11| |(S12+S21)/2| |S22|
- ( ) Combine — Blue File Green File Red File

BLUE Input Data File: |S11+S22|

GREEN Input Data File: |S12+S21|

RED Input Data File: |S11-S22|

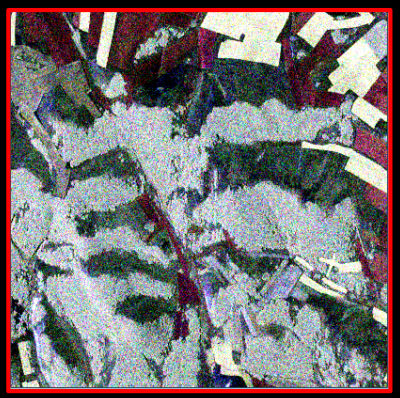
Color Channel Contrast Enhancement

[x] Automatic | MinMax | (•) Independant | ( ) Common

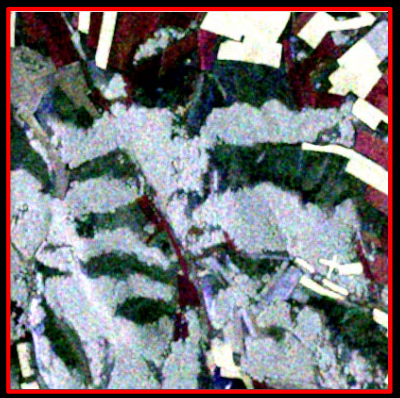
Blue Channel: Min Auto Max Auto | Red Channel: Min Auto Max Auto | Green Channel: Min Auto Max Auto

Output RGB File: J:/GF3_Data_Directory_BOX/T3/PauliRGB.bmp

Run 2 | Exit



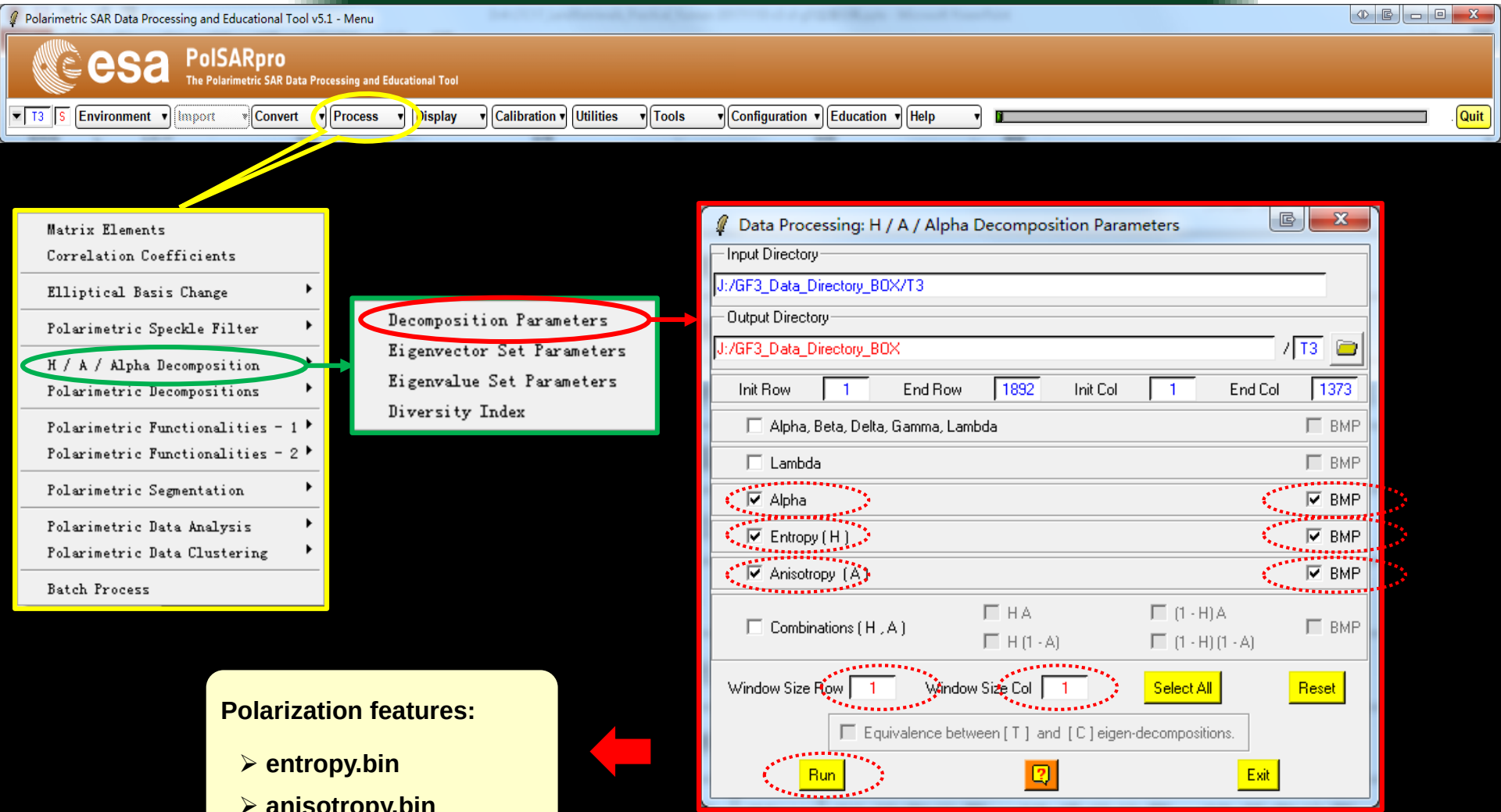
PauliRGB Before Filter



PauliRGB after Filter

Show the Filtered PauliRGB

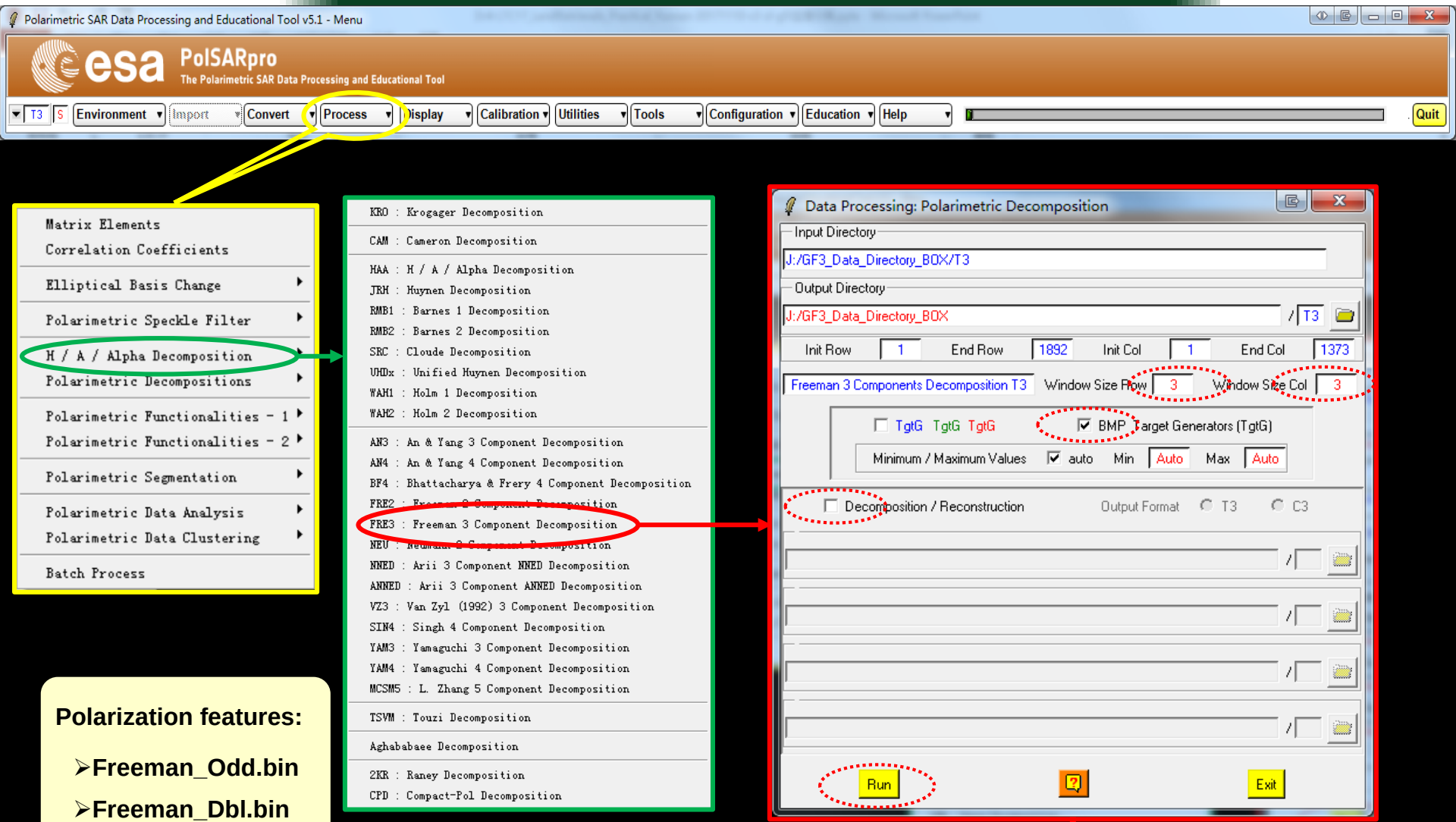
Step-3: Features Extraction



Polarization features:

- **entropy.bin**
- **anisotropy.bin**
- **alpha.bin**

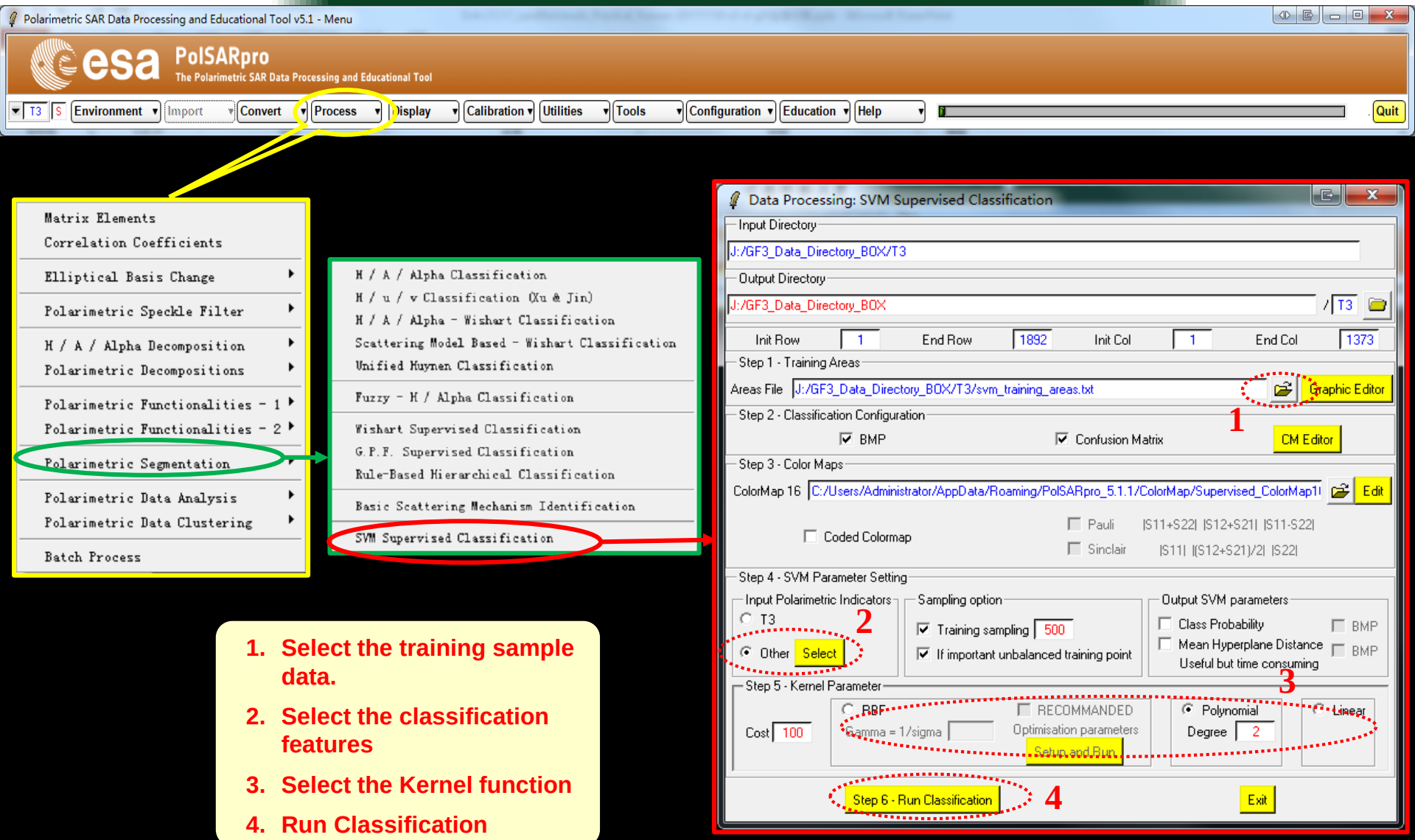
Step-3: Features Extraction



Polarization features:

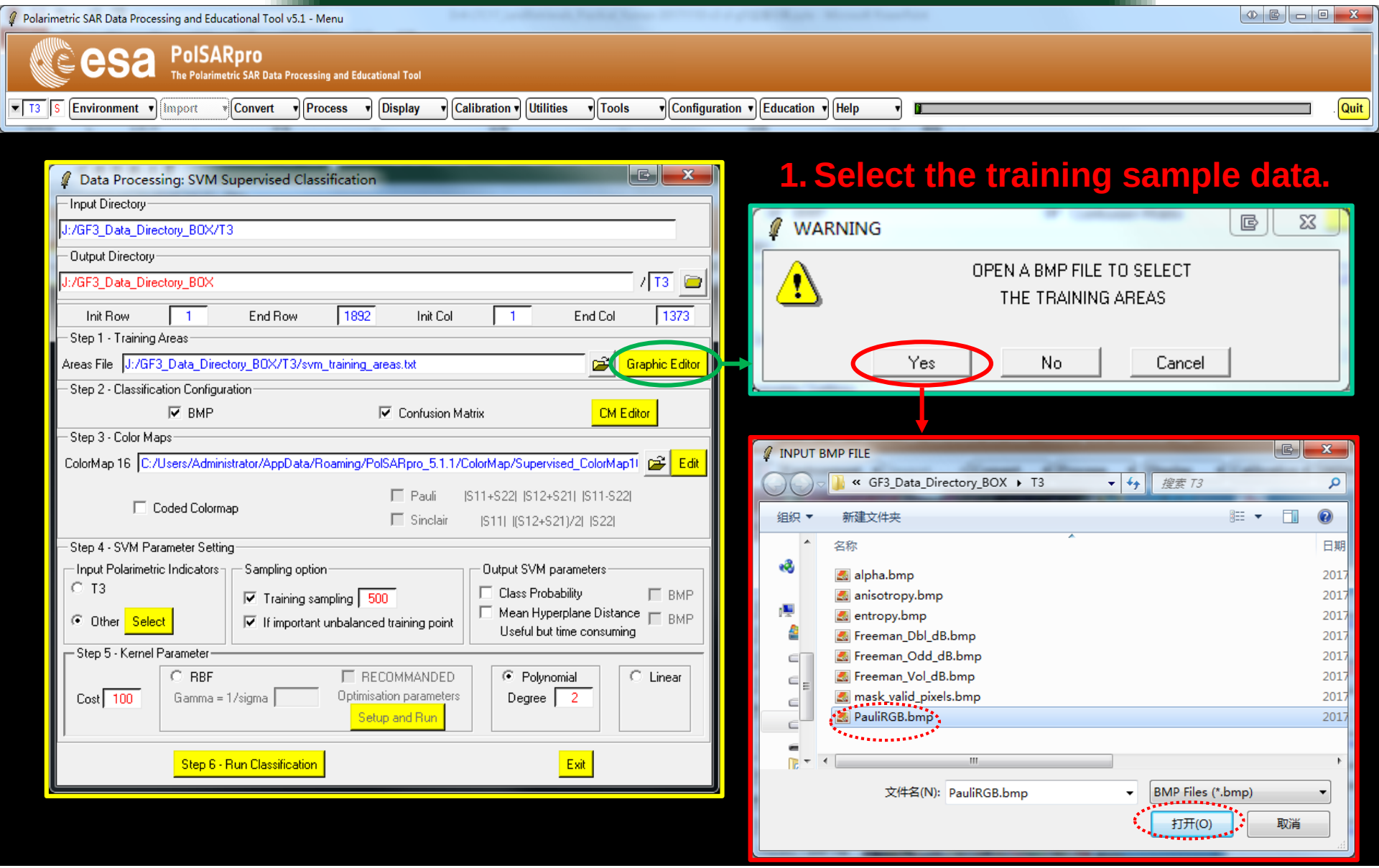
- ➢Freeman_Odd.bin
- ➢Freeman_Dbl.bin
- ➢Freeman_Vol.bin

Step-4: SVM classifier

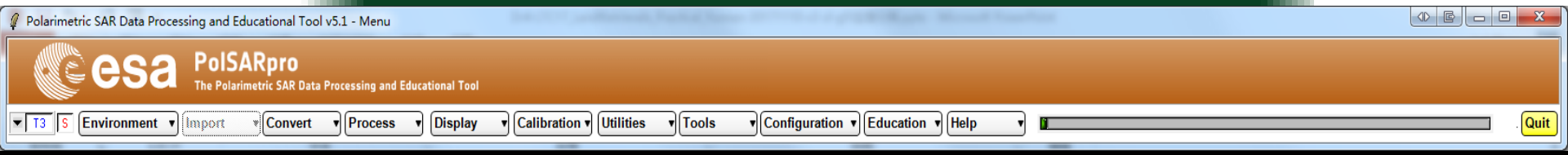


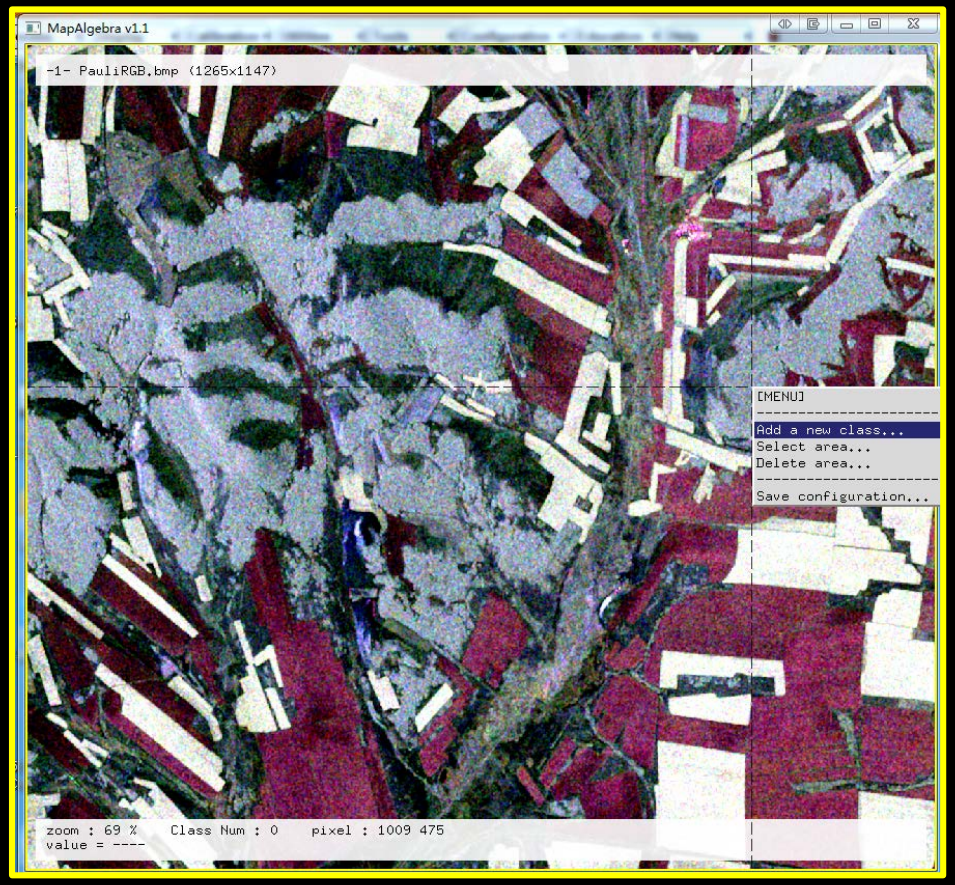
1. **Select the training sample data.**
2. **Select the classification features**
3. **Select the Kernel function**
4. **Run Classification**

Step-4.1: SVM classifier



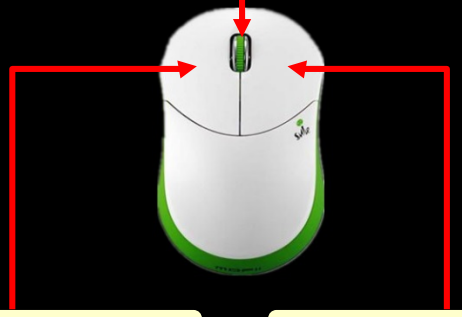
Step-4.1: SVM classifier





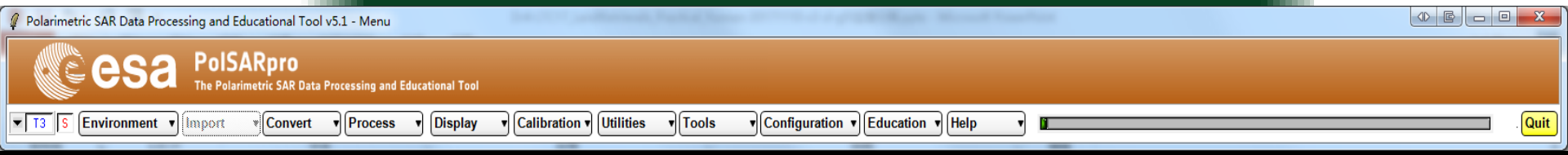
1. Select the training sample data.

Basic operation:

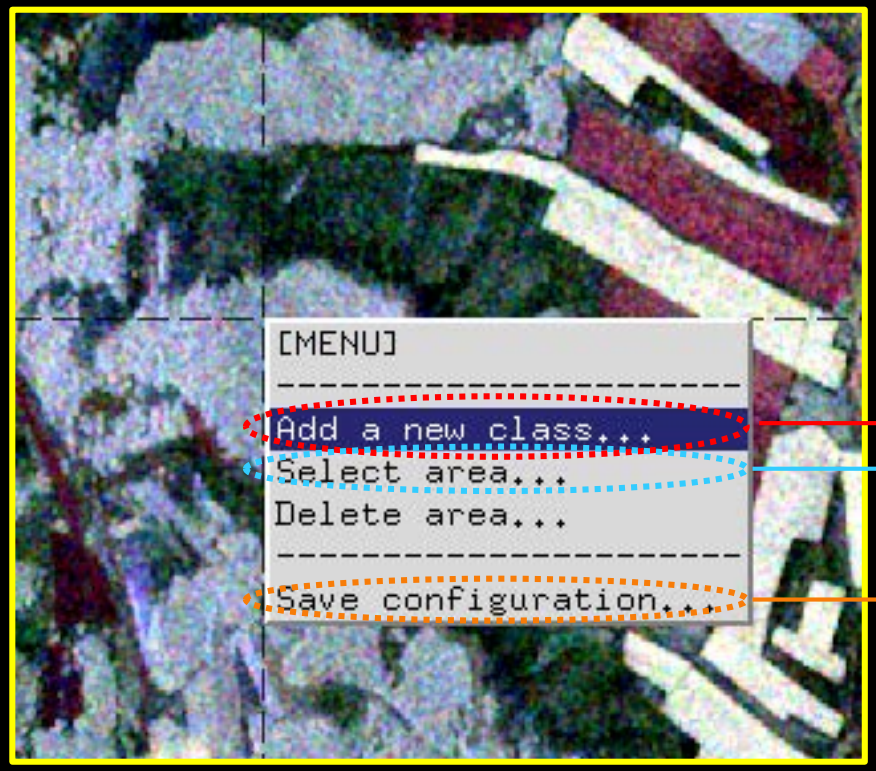


- Zoom button
- Select button
- Open the menu

Step-4.1: SVM classifier



1. Select the training sample data.



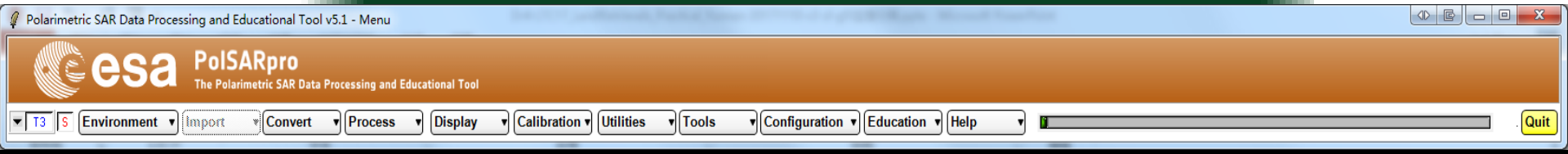
Basic operation:

1. Add a new class 1.
2. Select first area for class1;Select second area for class1;....
3. Add a new class 2.
4. Select first area for class2;Select second area for class2;....

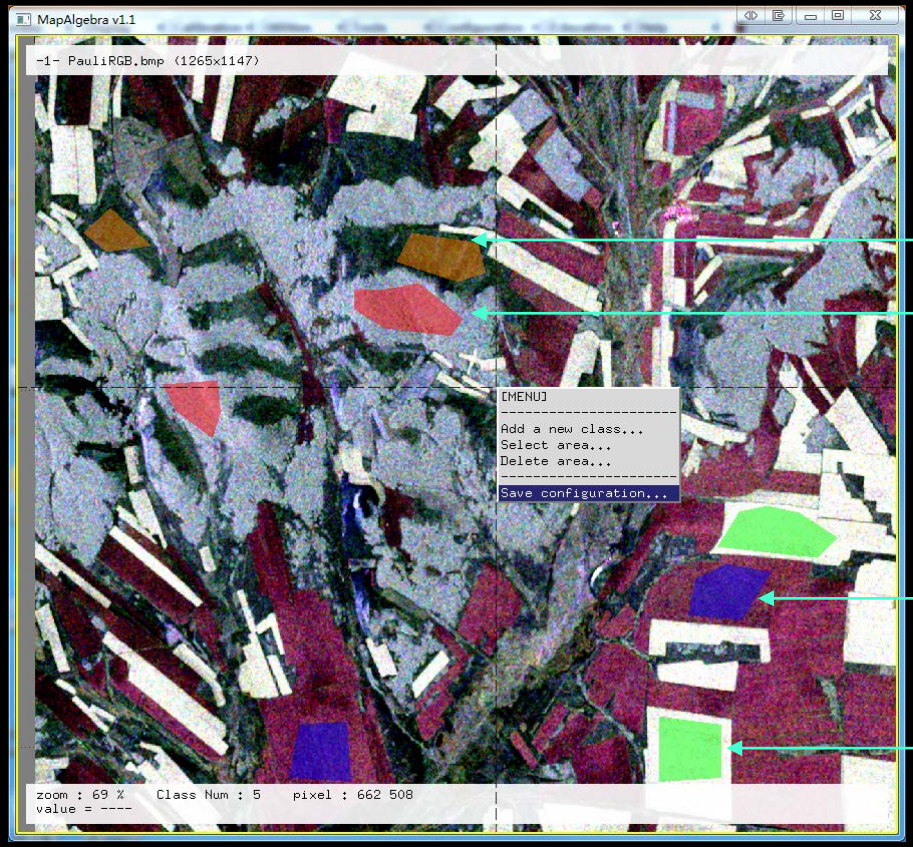
....

10. Save configuration

Step-4.1: SVM classifier

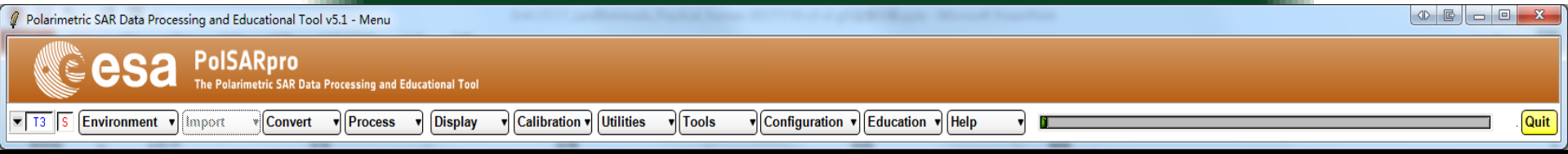


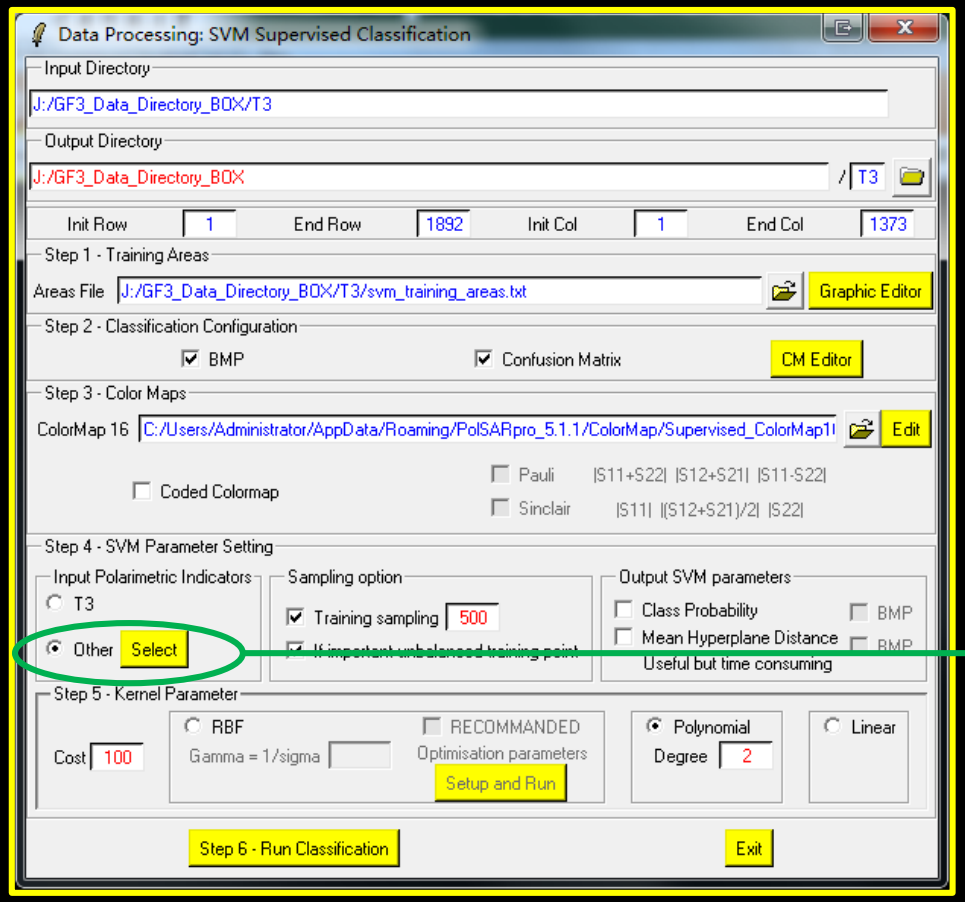
1. Select the training sample data.



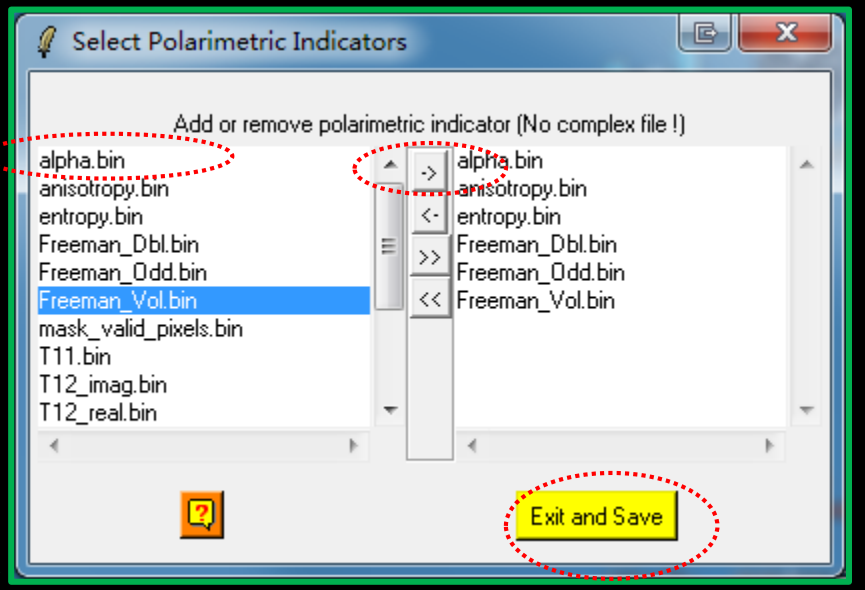
Do it yourself.
Prepare the training sample data

Step-4.2: SVM classifier



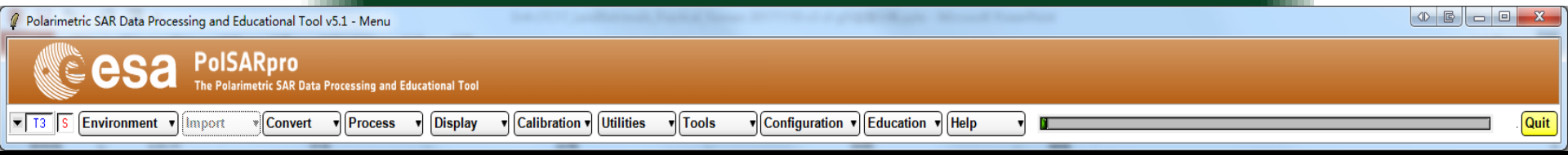


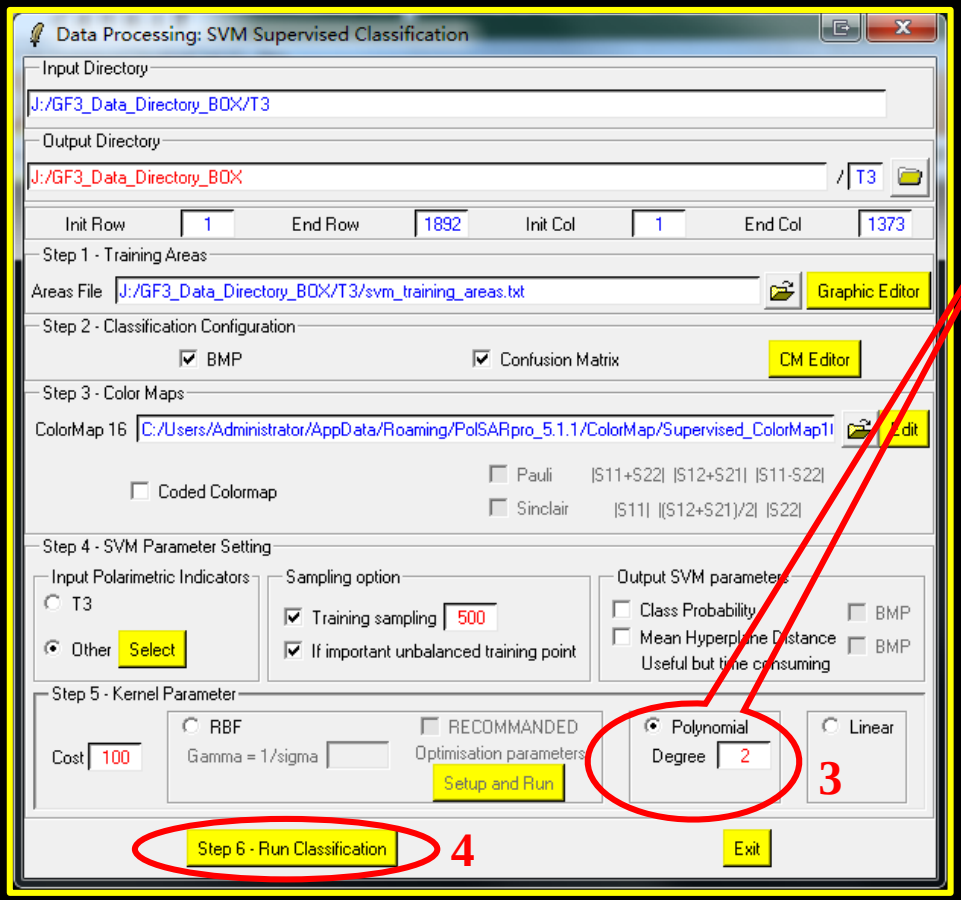
2. Select the classification features



Select the features that need to be added to the classifier

Step-4.3: SVM classifier

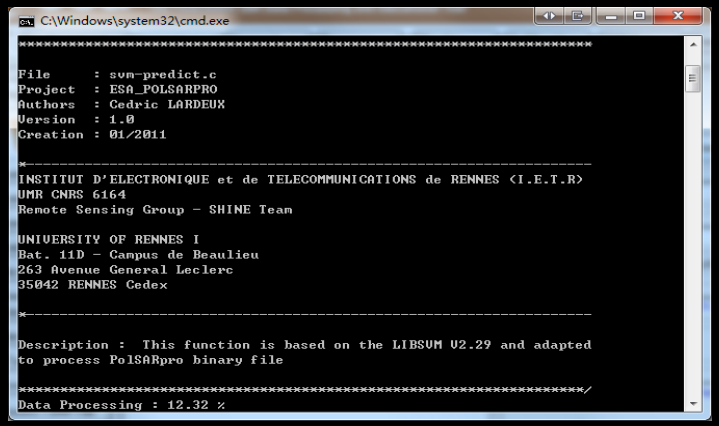




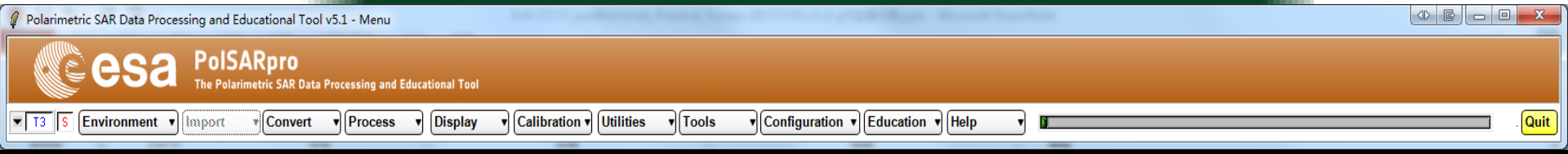
3. Select the Kernel function

- We choose polynomial kernel function
- Degree:2

4. Run Classification



Classification Result



svm_classification_file.bmp

Do it yourself:

Select different kernel functions to classify and compare the classification results.

Questions ?