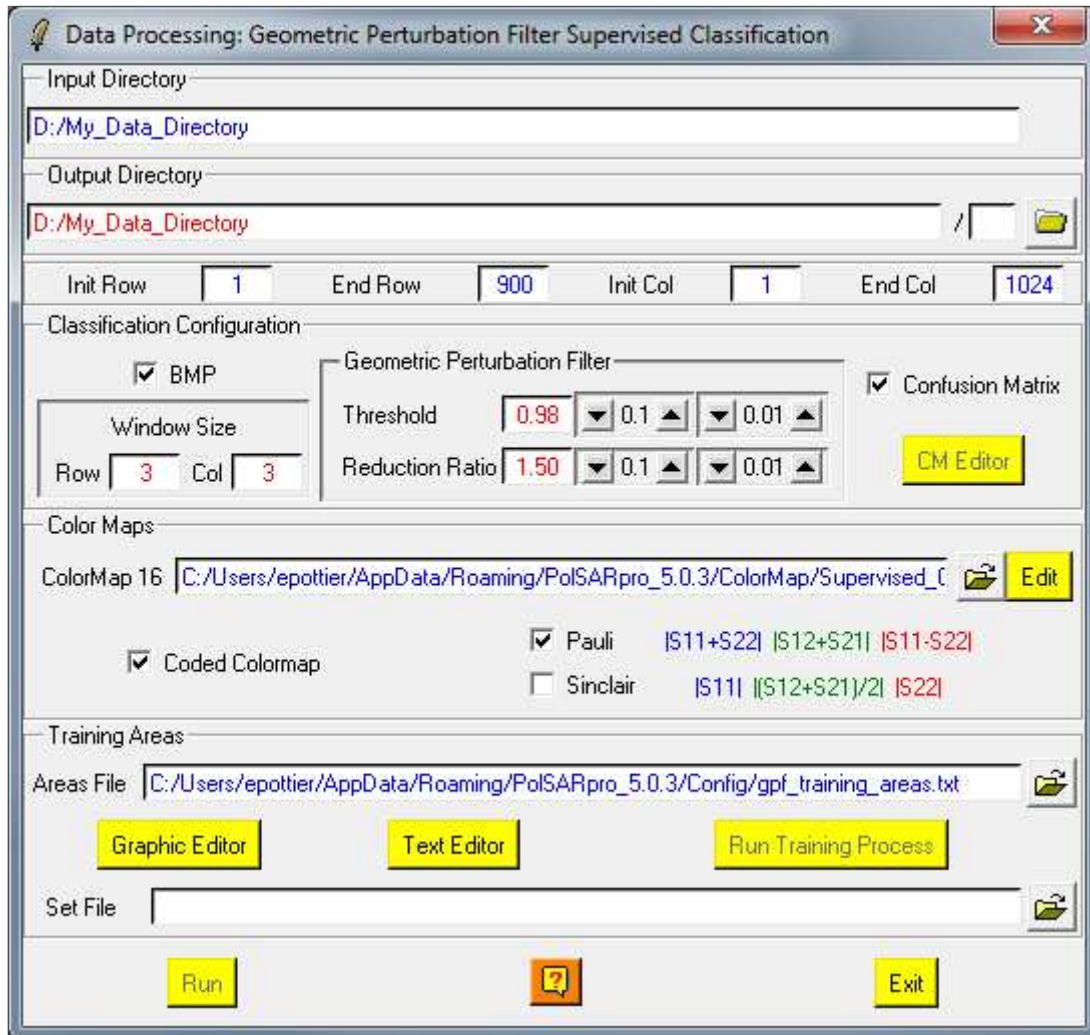


Geometric Perturbation Filter (G.P.F) Supervised Classification



The screenshot shows the 'Data Processing: Geometric Perturbation Filter Supervised Classification' window. It contains the following sections:

- Input Directory:** D:/My_Data_Directory
- Output Directory:** D:/My_Data_Directory
- Init Row:** 1, **End Row:** 900, **Init Col:** 1, **End Col:** 1024
- Classification Configuration:**
 - ☒ **BMP**
 - Window Size:** Row 3, Col 3
 - Geometric Perturbation Filter:**
 - Threshold:** 0.98 (with 0.1 and 0.01 adjustment buttons)
 - Reduction Ratio:** 1.50 (with 0.1 and 0.01 adjustment buttons)
 - ☒ **Confusion Matrix** (with a **CM Editor** button)
- Color Maps:**
 - ColorMap 16:** C:/Users/epottier/AppData/Roaming/PolSARpro_5.0.3/ColorMap/Supervised_C (with an **Edit** button)
 - ☒ **Coded Colormap**
 - ☒ **Pauli** (with color-coded labels: |S11+S22|, |S12+S21|, |S11-S22|)
 - ☐ **Sinclair** (with color-coded labels: |S11|, |S12+S21|/2|, |S22|)
- Training Areas:**
 - Areas File:** C:/Users/epottier/AppData/Roaming/PolSARpro_5.0.3/Config/gpf_training_areas.txt (with a file selection icon)
 - Buttons: **Graphic Editor**, **Text Editor**, **Run Training Process**
- Set File:** (with a file selection icon)
- Bottom Buttons:** **Run**, **Help** (question mark icon), **Exit**

Description:

This program creates binary and bitmap image files resulting from the supervised classification of polarimetric data using the supervised Geometric Perturbation Filter (GPF).

Comments:

Parameters written in Red can be modified directly by the user from the keyboard.

Input/Output Arguments:

Input Directory	Indicates the complete location of the considered Main Directory (MD) containing the Sinclair monostatic [S2] matrix data to be classified.
Output Directory	Indicates the location of the processed data output directory. The default value is set automatically to the Main Directory (MD) .

Output Image Number of Rows/Columns:

The output image numbers of rows and columns are initialised to the input data set dimensions.

Users wishing to process a sub-part of the initial image can modify the **Init** and **End** values of the converted images rows and columns.

Note: init and end values have to remain within the range defined by the input image dimensions.

Classification Configuration:

Window Size	Data to be decomposed may be processed through an additional filtering procedure consisting of a boxcar filter. Users have then to set the size of the (NxN) sliding window used to compute the local estimate of the average matrix. Users wishing to avoid additional filtering may set N to 1.
Geometric Perturbation Filter	User have to set the GPF configuration parameters : threshold and reduction ratio
Confusion Matrix	<p>A processing option enables the creation of Confusion Matrix text files that can be edited, once the classification algorithm is terminated.</p> <p>The Confusion Matrix output files are:</p> <ul style="list-style-type: none">• MD / confusion_matrix_X.txt• MD / confusion_matrix_rej_X.txt

The variable **X** indicates the window size of the eventual additional filtering performed prior to data classification.

ColorMap:

The colour coding of the bitmap output files is realized by the way of a 16 element colormap initialised with arbitrary values. Users have the possibility to modify the elements of the colormap in an interactive way.

There exists also the possibility to create an automatic **Coded Colormap** obtained from an RGB colour coding of each Class Feature Vectors.

Training Areas:

Training areas may be defined by the way of a graphic interface or a text editor. The graphic interface permits to delimitate areas by defining regions of interest on a visual representation of the data to be classified.

Note: See the [Training Graphic Editor Help](#) file for a precise description of all the different functionalities.

Users wishing to define training areas from specific coordinates may first save a temporary training_areas.txt and modify it according to their needs using the training area text editor.

Training Process:

Once training areas are defined, the training process can start. The program collects the coordinates of each training area and computes each class centre matrix.
