

6th ADVANCED COURSE

ON RADAR POLARIMETRY 2021

PolSARpro v6 (Biomass Edition)

Practical session – part 1

Basic Concepts

POTTIER Eric

IETR / University of Rennes 1, France

11-12 / 05 / 2021



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

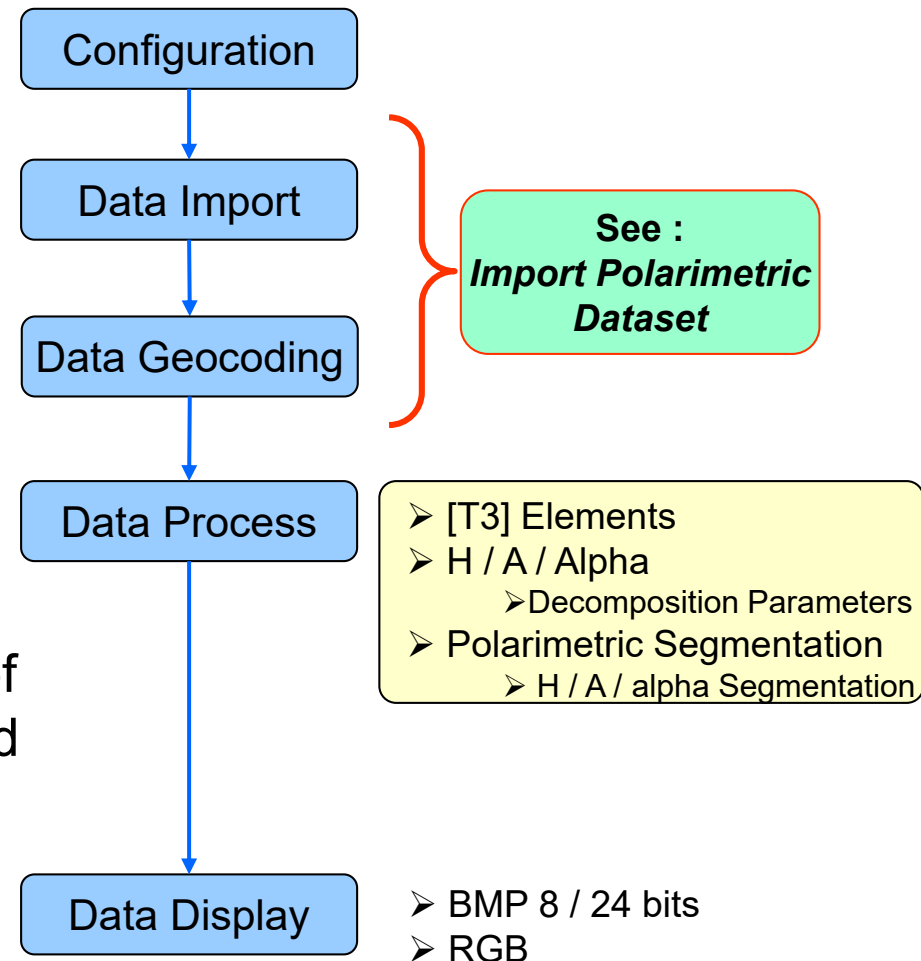
DATA SETS



PolSARpro v6.0 (Biomass Edition) Software performs complete end-to-end processing without the need for any other software.

Data Processing Approach along a '**recommended**' and easy processing chain

Provide a **First Qualitative Analysis** of the fully polarimetric data set processed



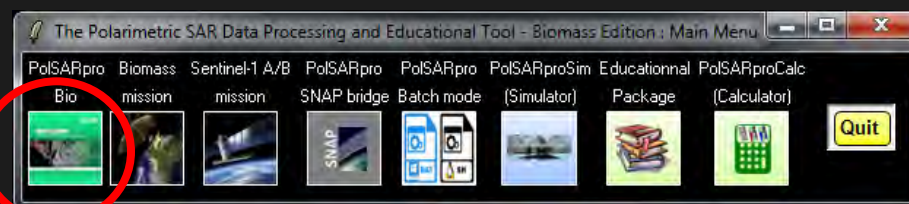
PoISARpro - Bio SOFTWARE

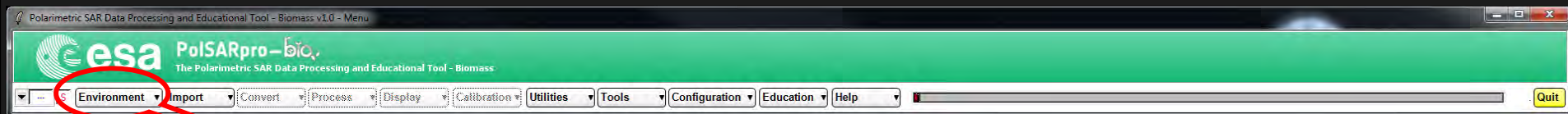


ENTRY SCREEN

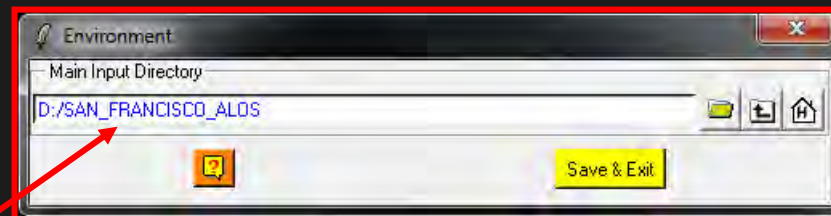


MAIN WINDOW





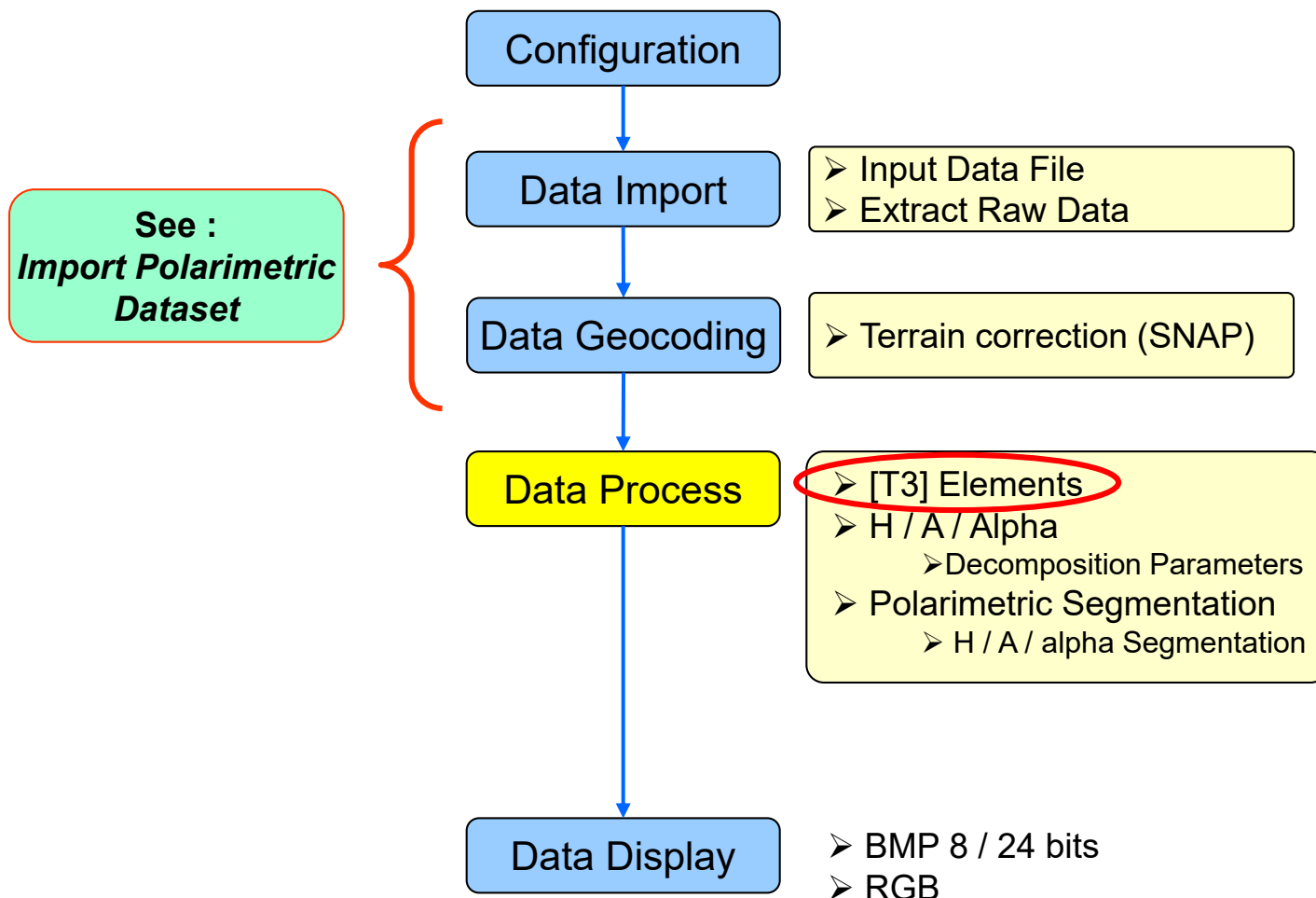
- Single Data Set (Pol-SAR)
- Dual Data Sets (Single Baseline Pol-InSAR)
- Multi Data Sets (Time series / Pol-TomSAR)

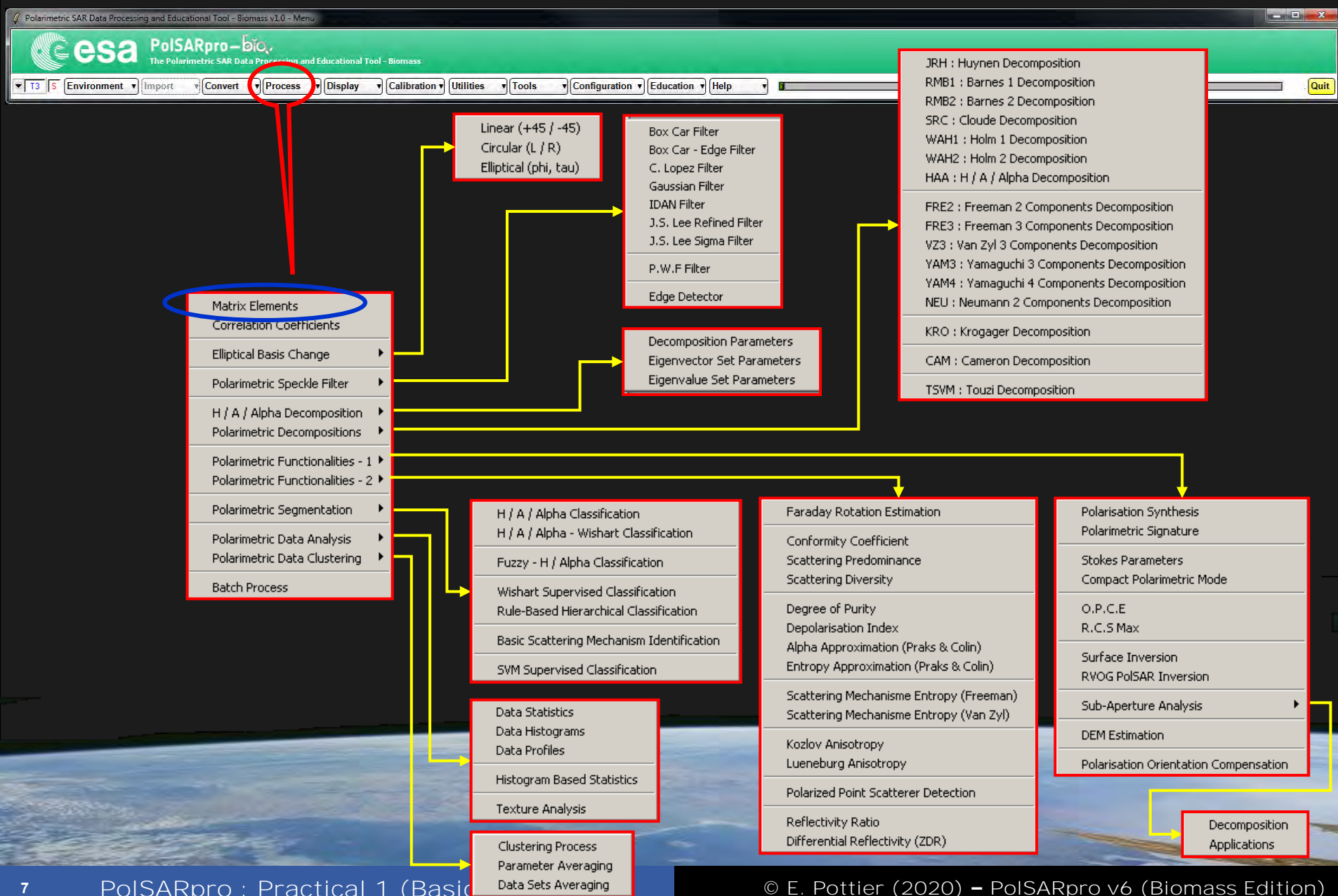


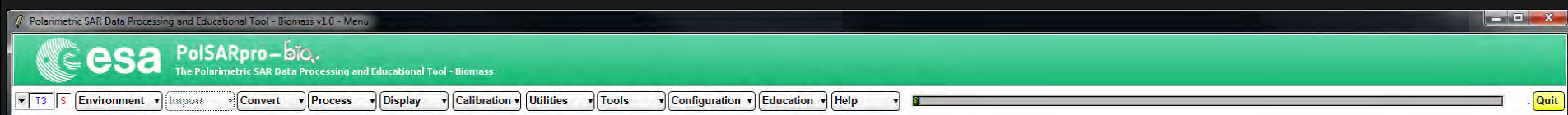
Configure Data Main Directory location

Input Data Directory :

C:/ ... / SAN_FRANCISCO_ALOS-1_SNAP







DATADIR

T3

config.txt

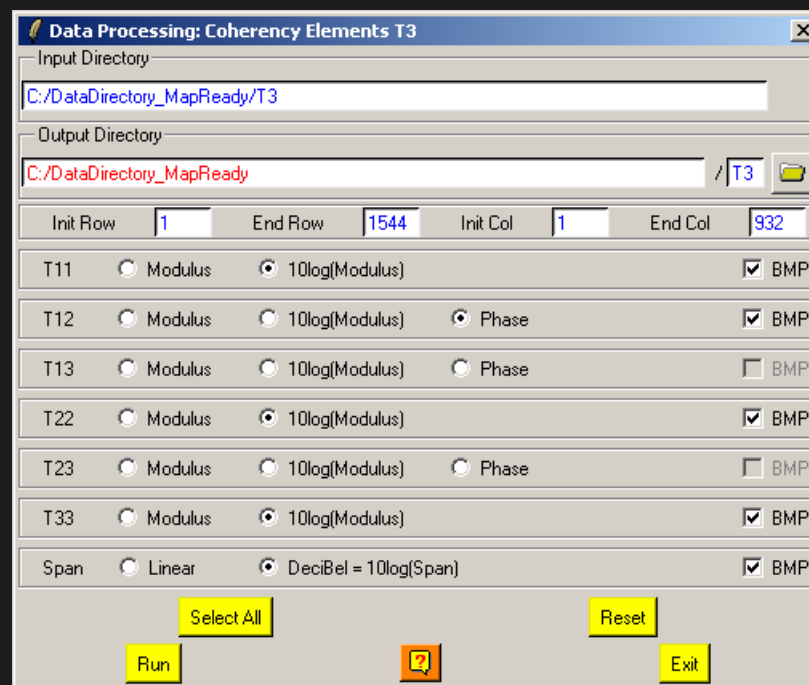
[T3x3] Elements



Txy_mod.bin
Txy_db.bin
Txy pha.bin



Txy_mod.bmp
Txy_db.bmp
Txy pha.bmp



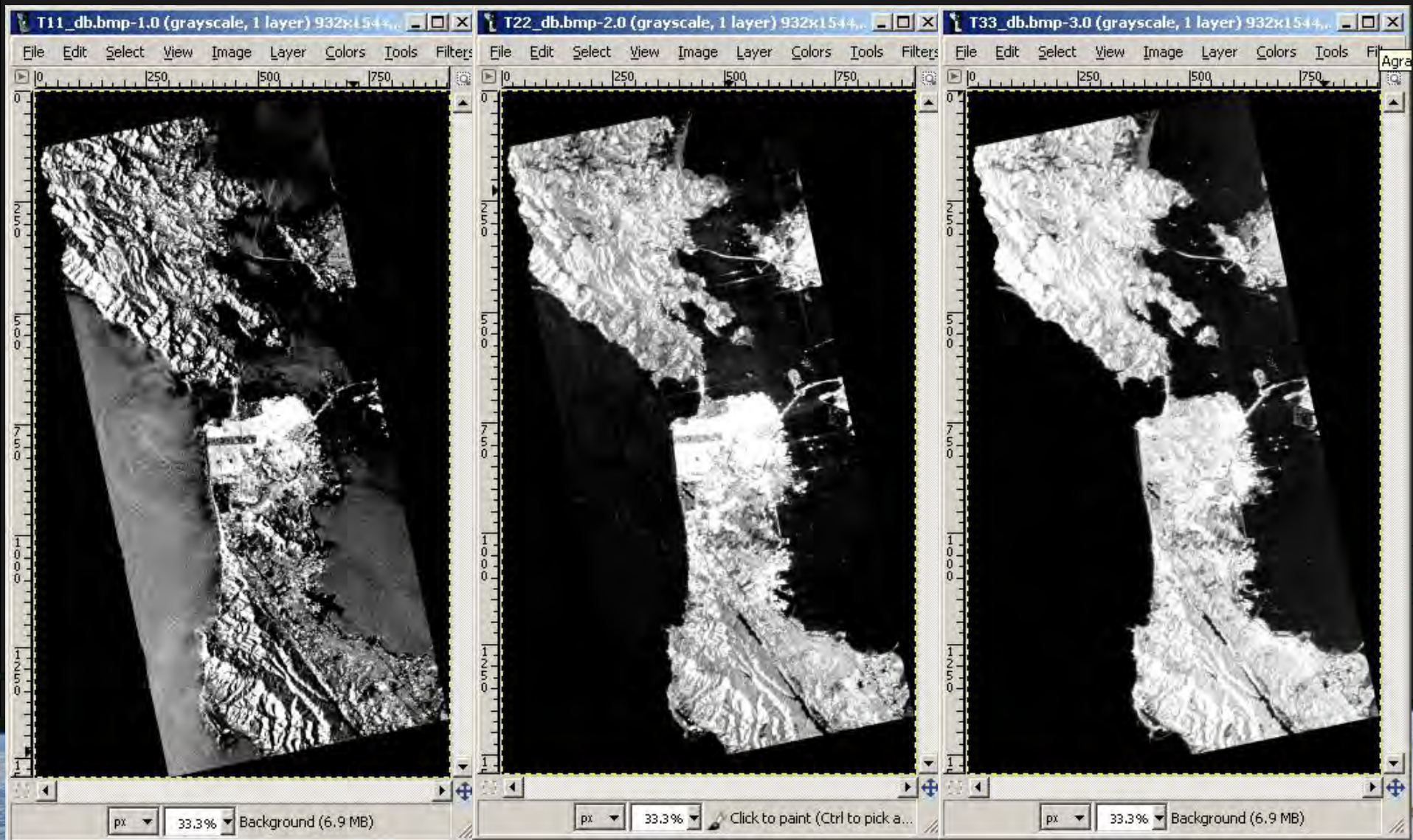
Do it Yourself:

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

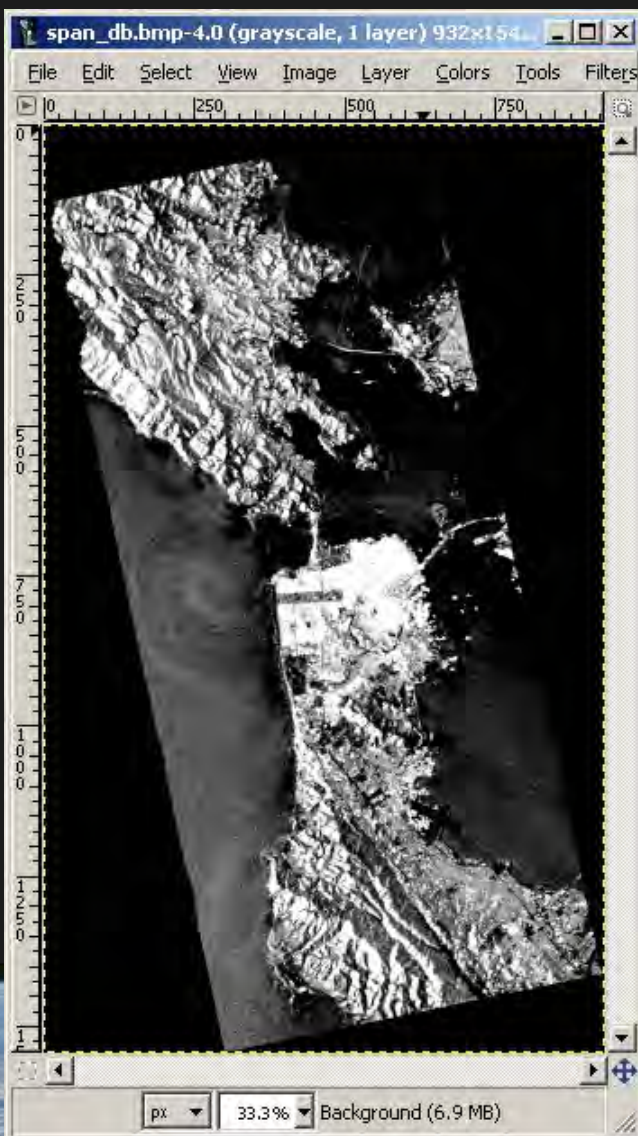
T11_dB

T22_dB

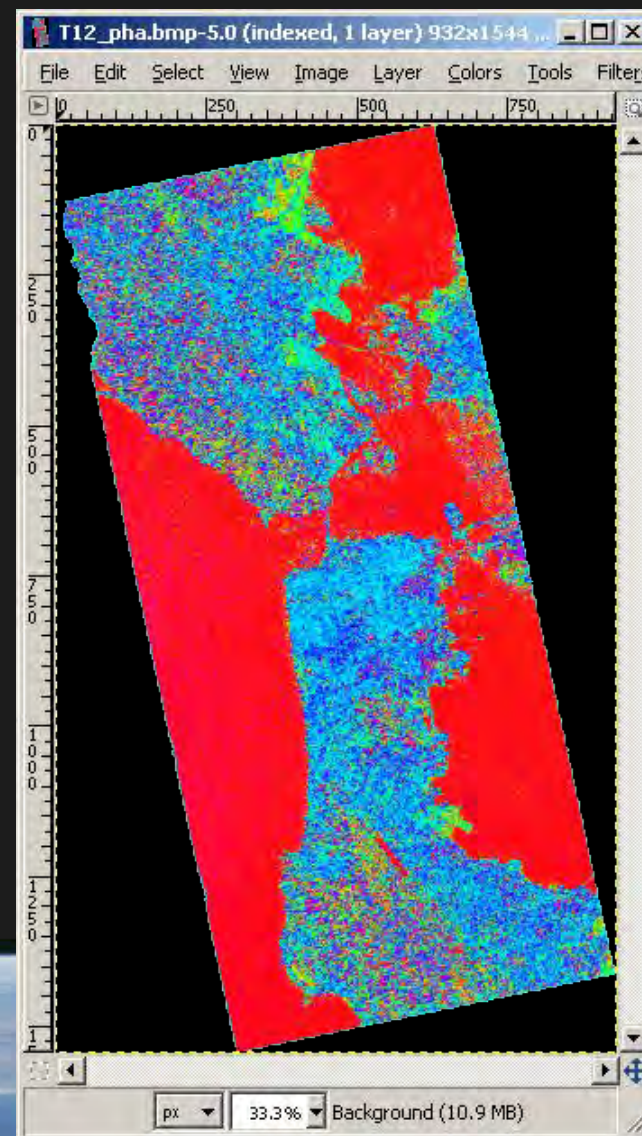
T33_dB



span_dB

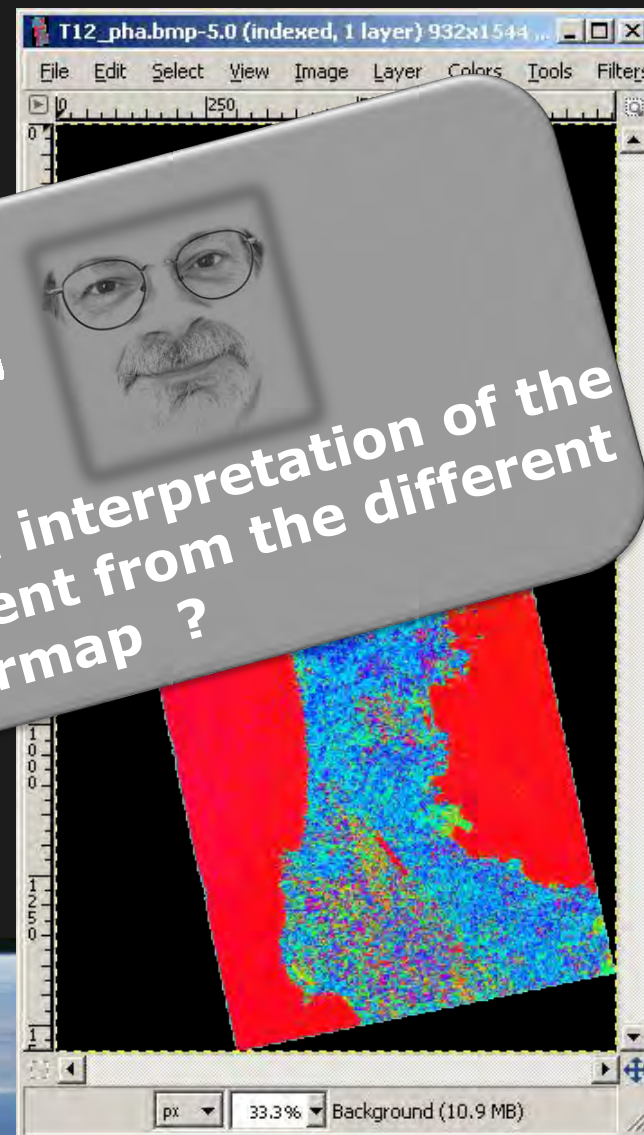
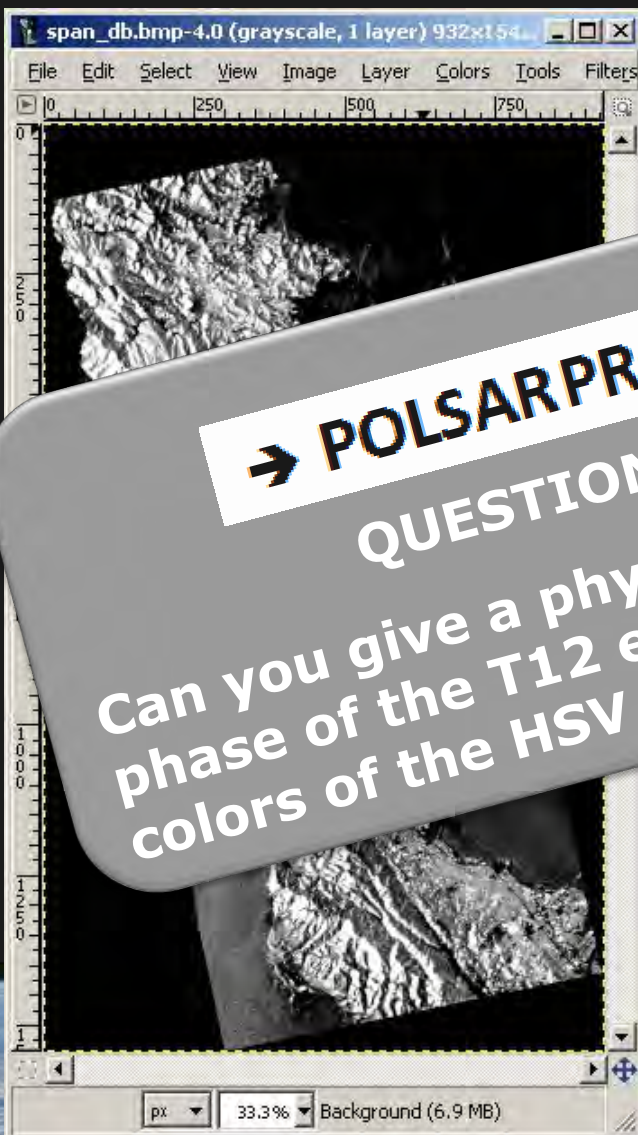


T12 pha



span_dB

T12 pha

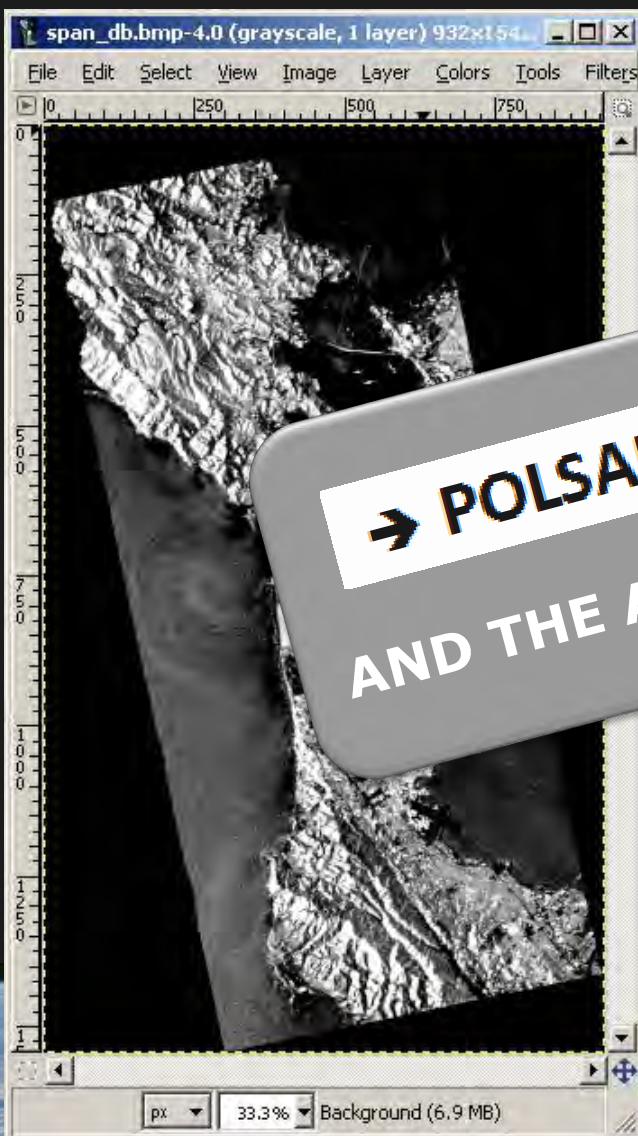


→ **POLSARPROF**

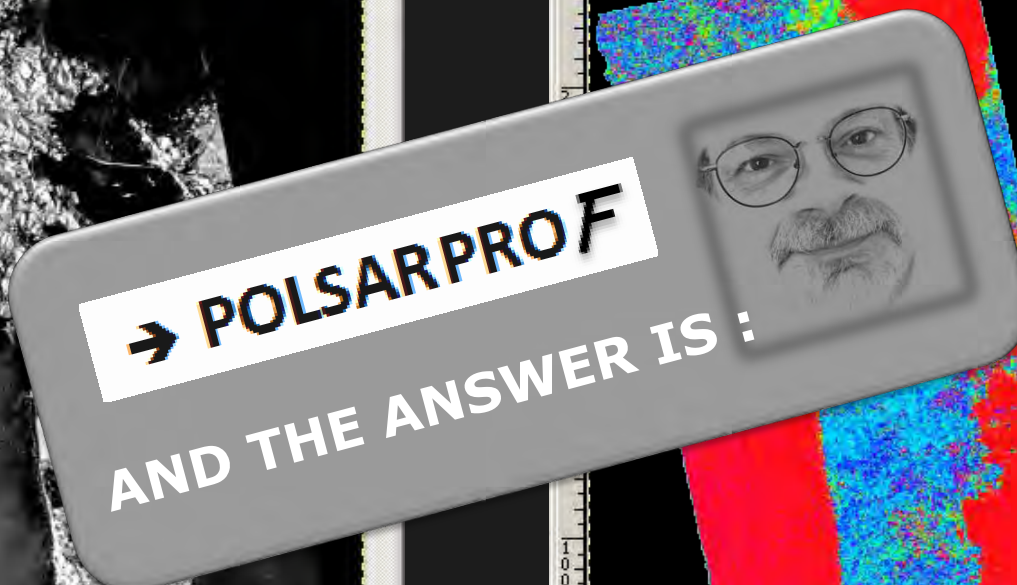
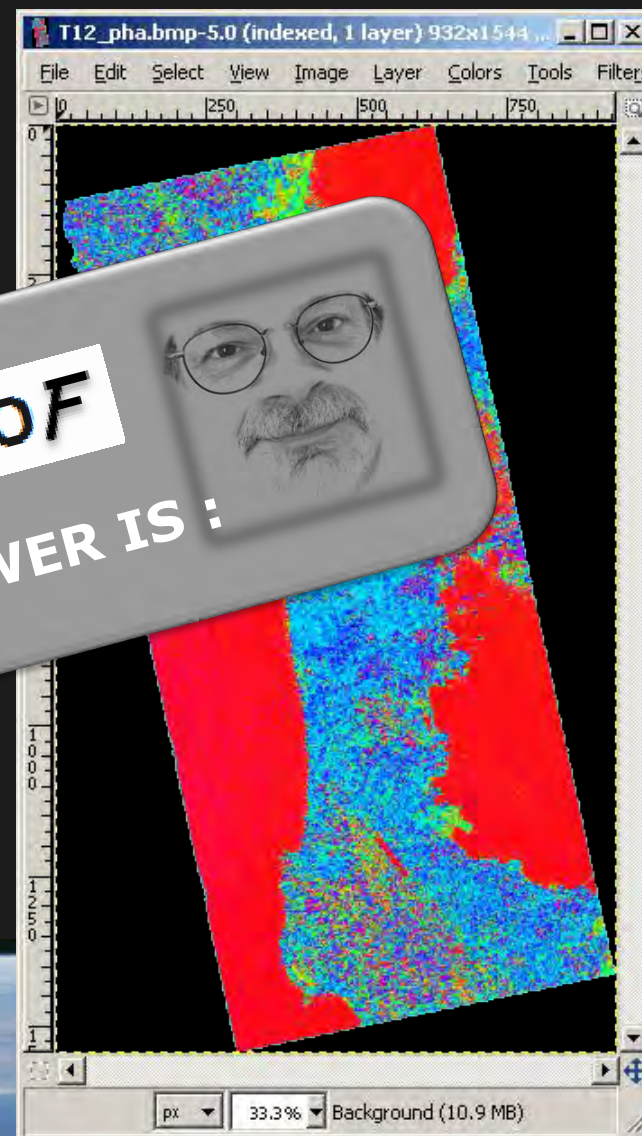
QUESTION :

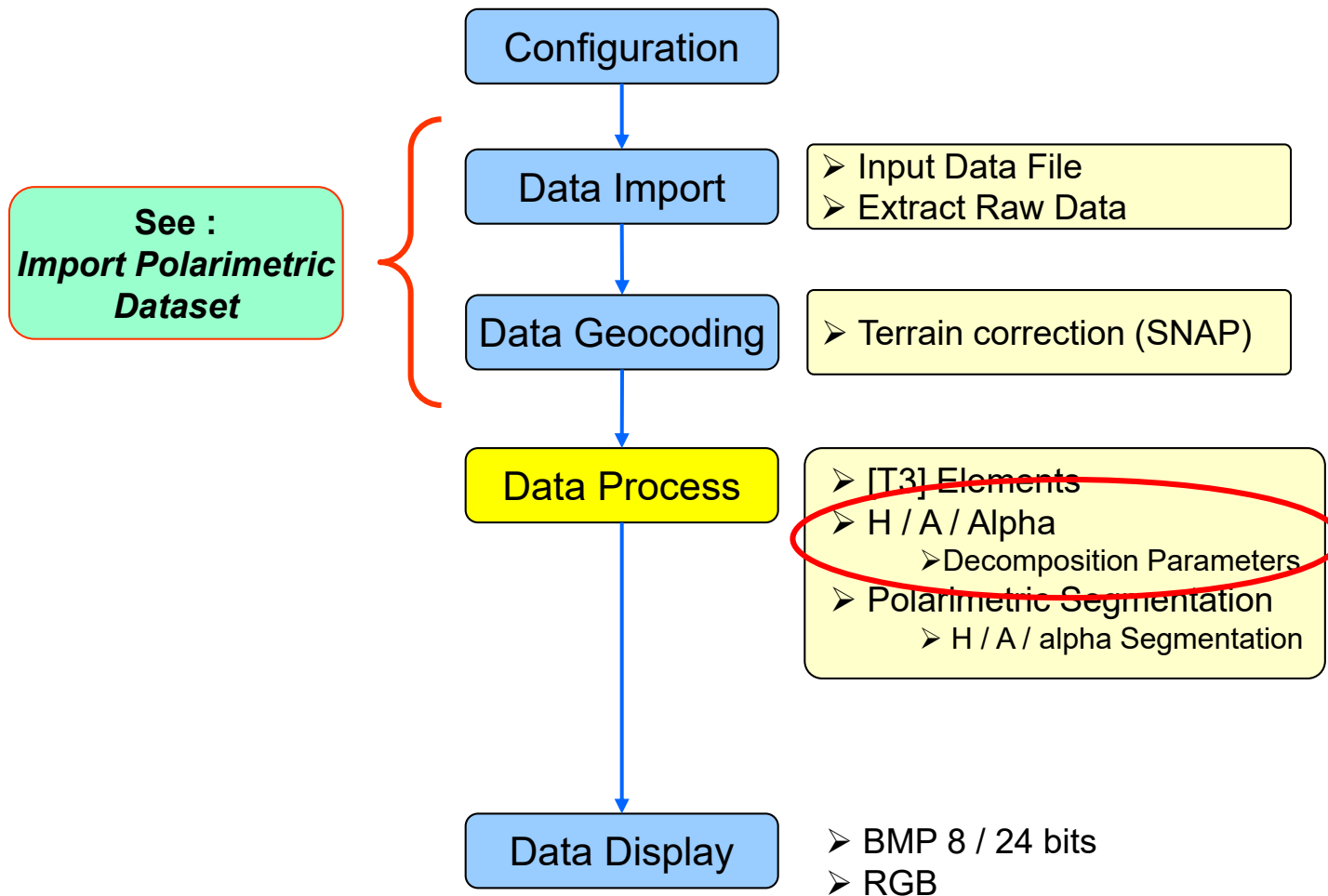
Can you give a physical interpretation of the phase of the T12 element from the different colors of the HSV colormap ?

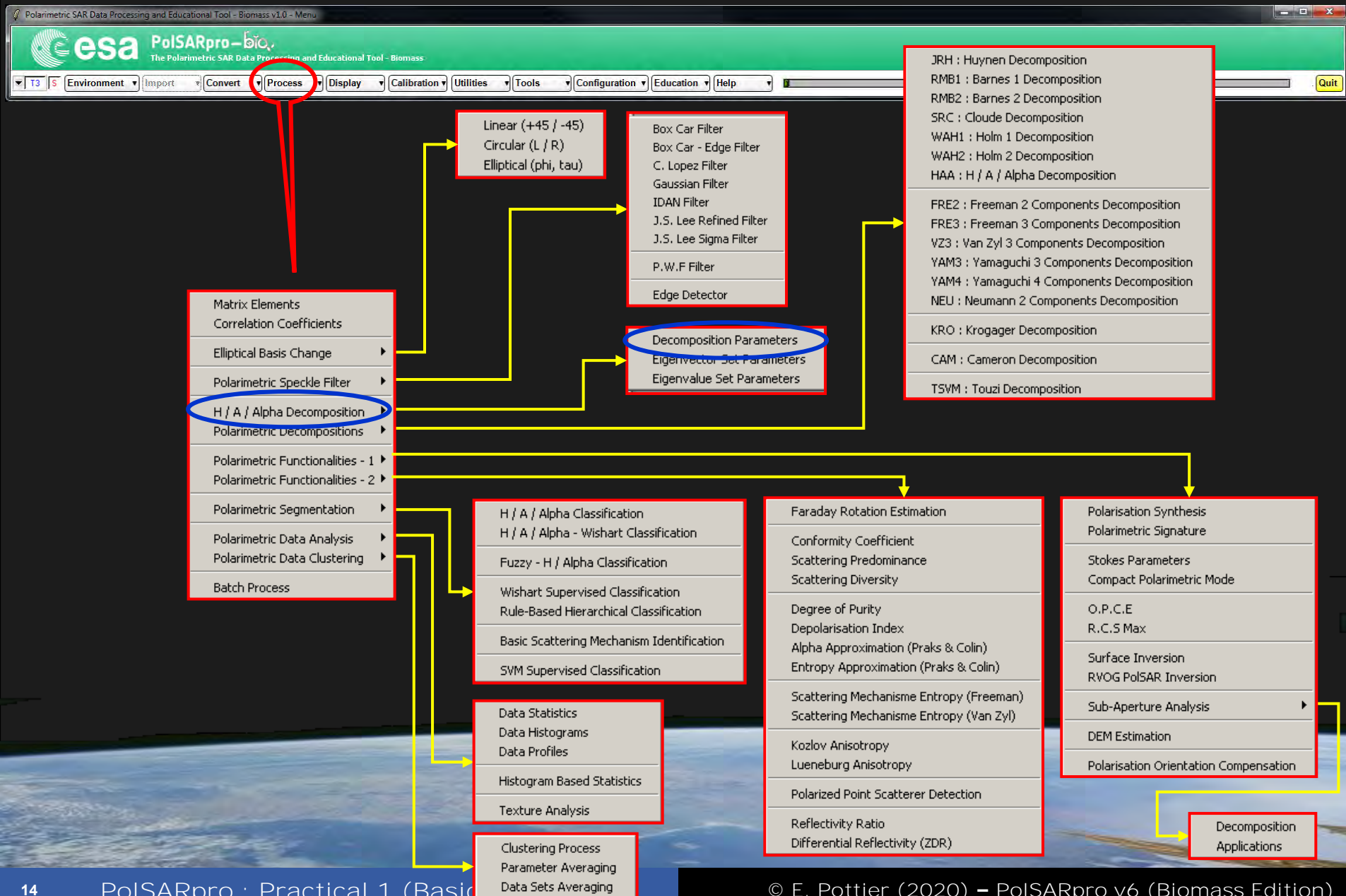
span_dB

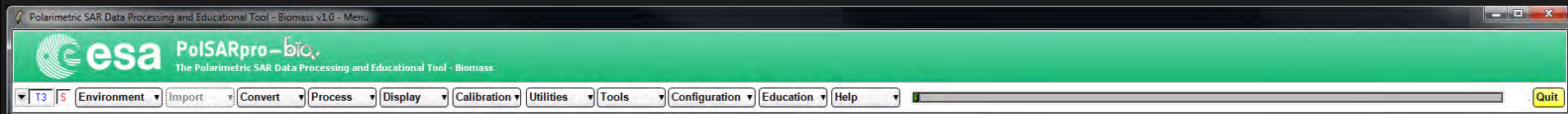


T12 pha



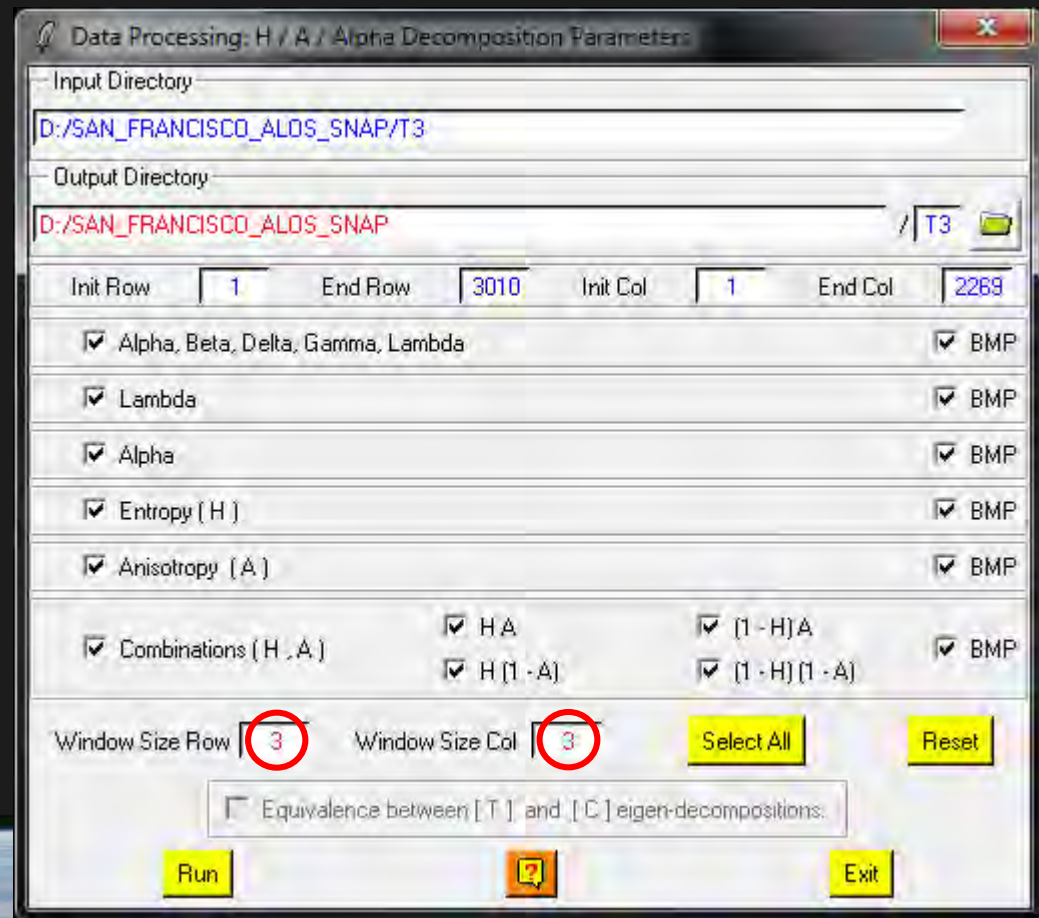






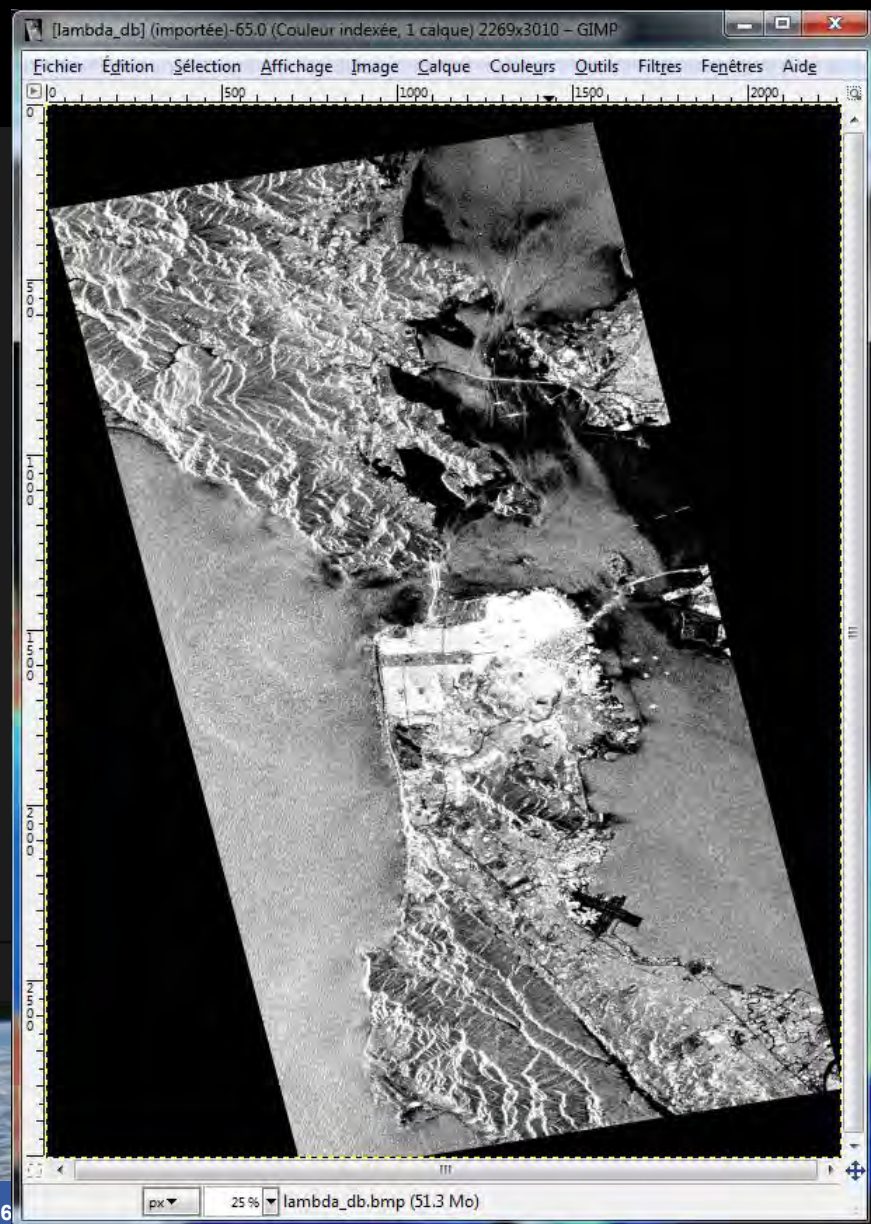
Do it Yourself:

Select some elements, set the parameters ($N_{win} = 3$) and view the corresponding BMP files (select BMP).

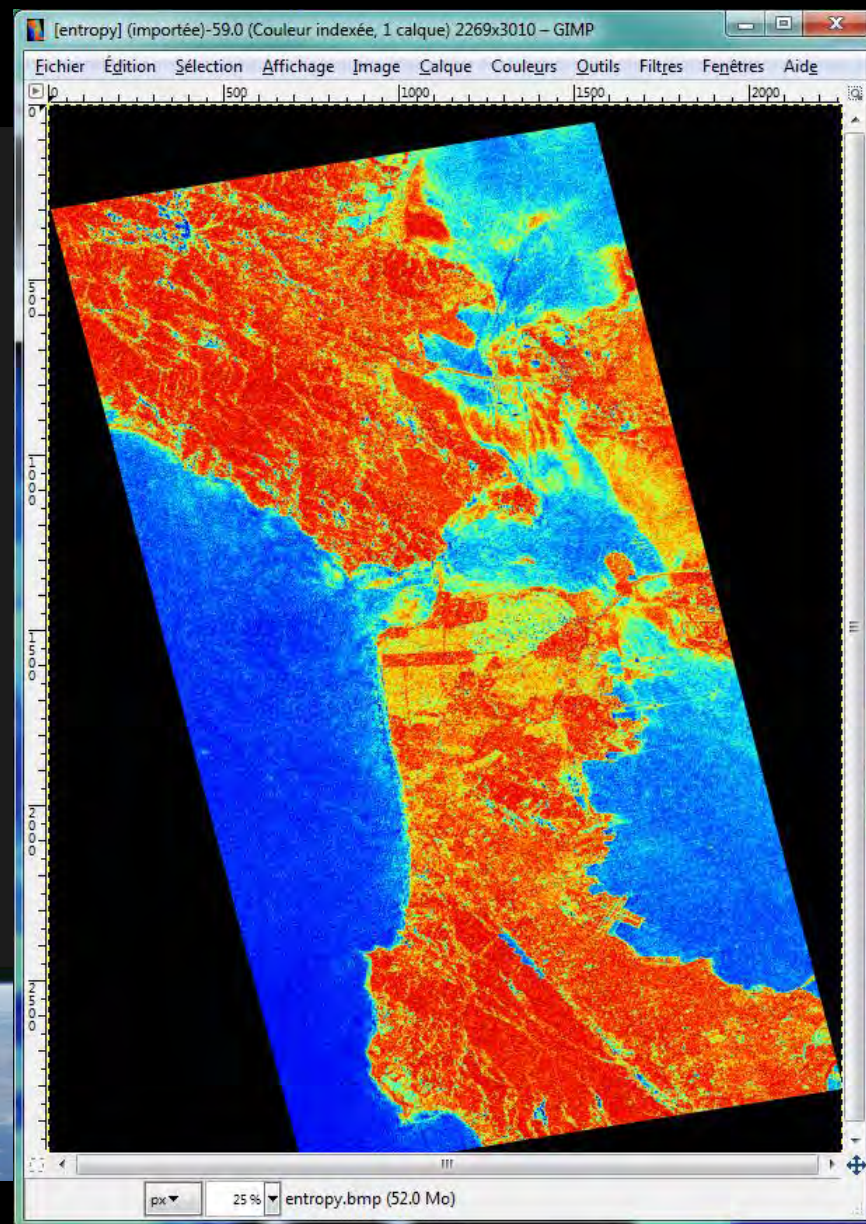


DECOMPOSITION PARAMETERS

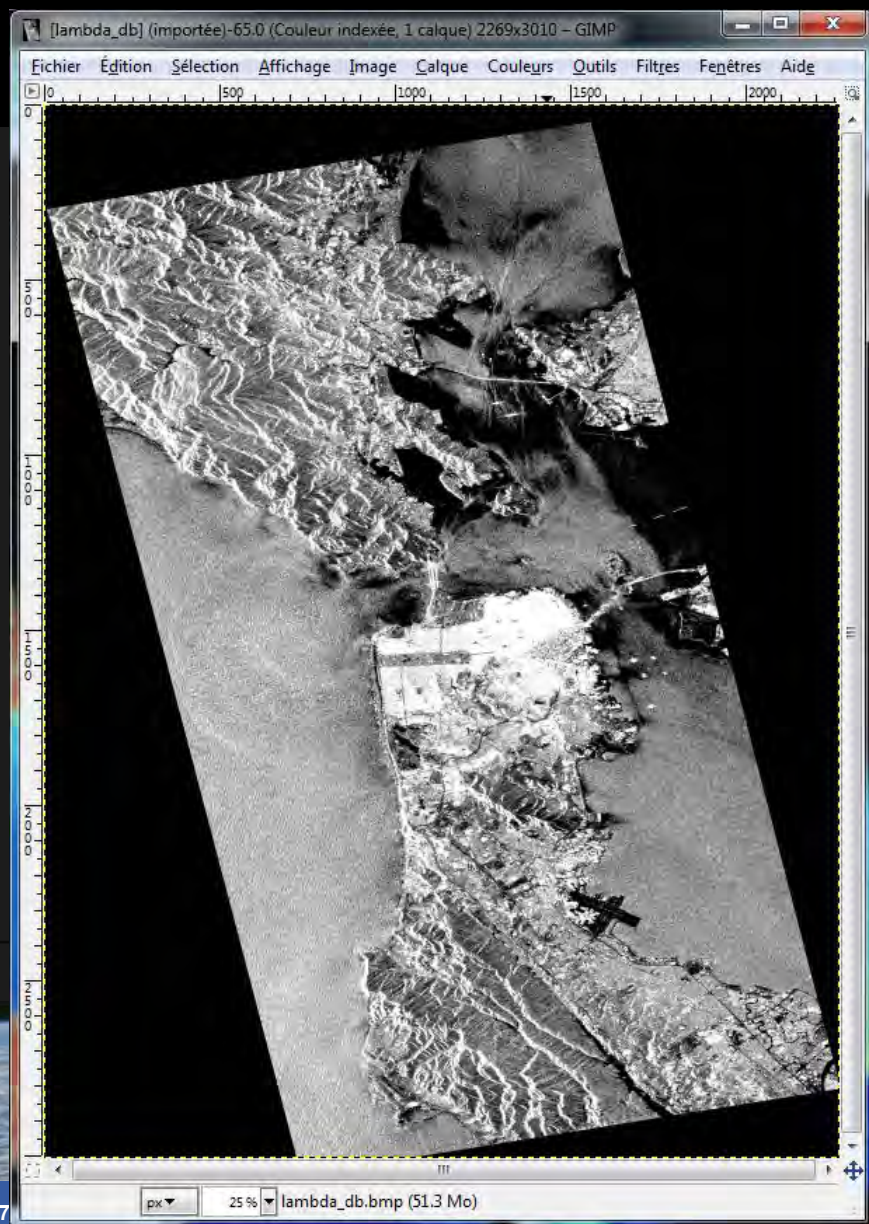
Lambda



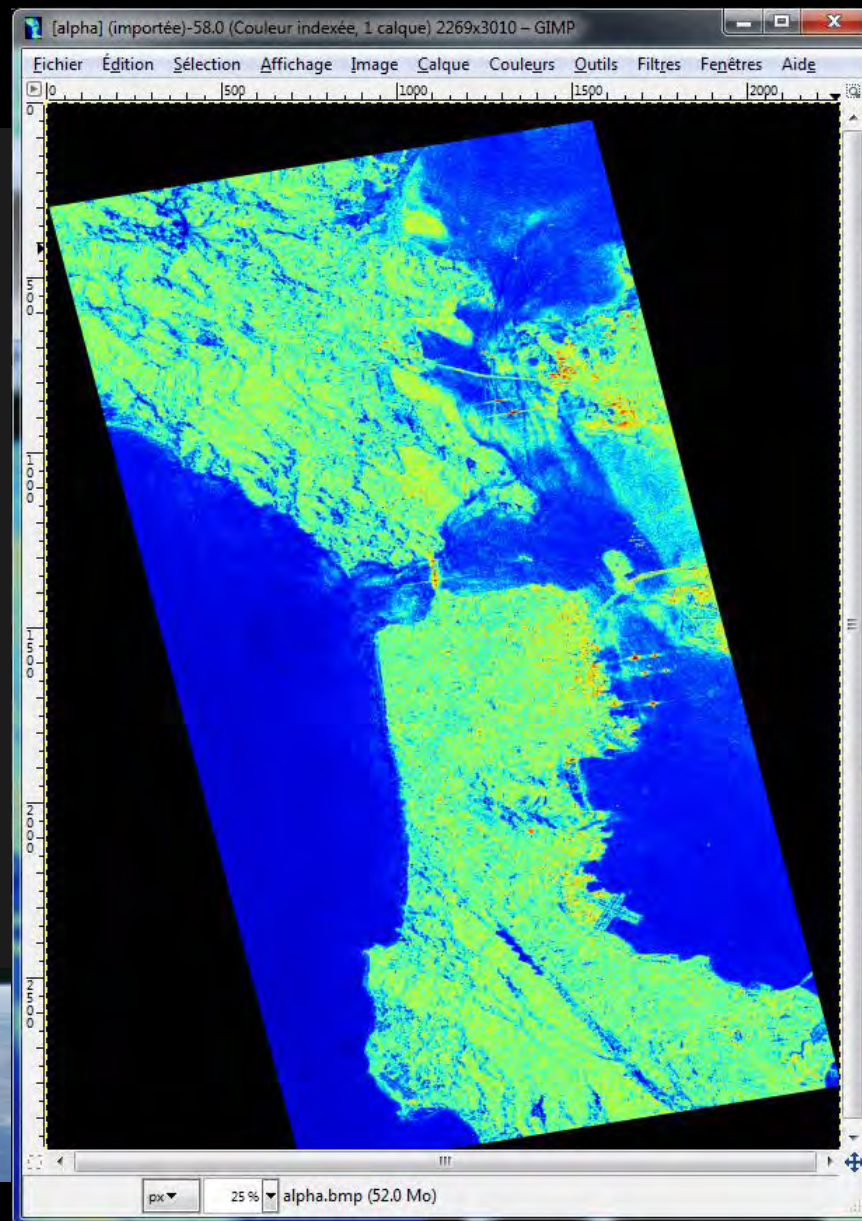
Entropy



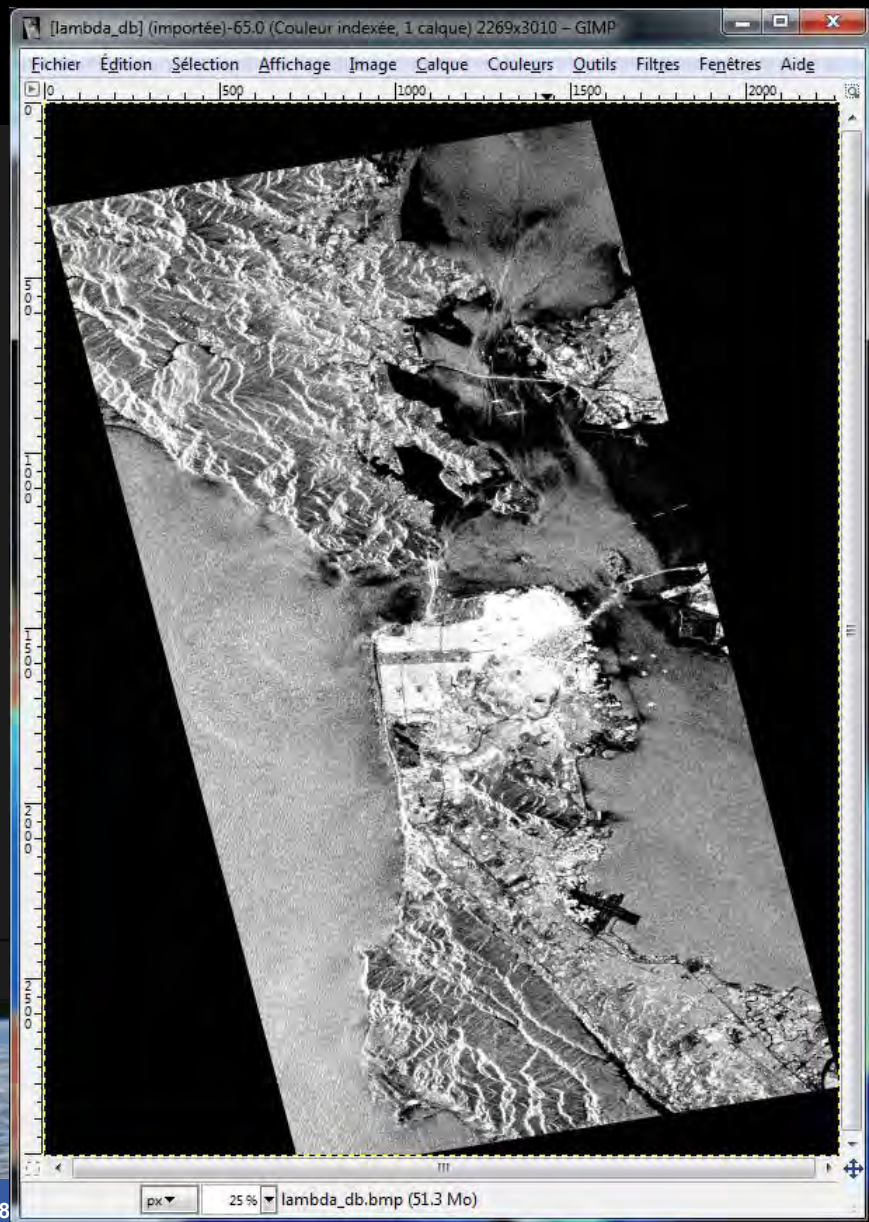
Lambda



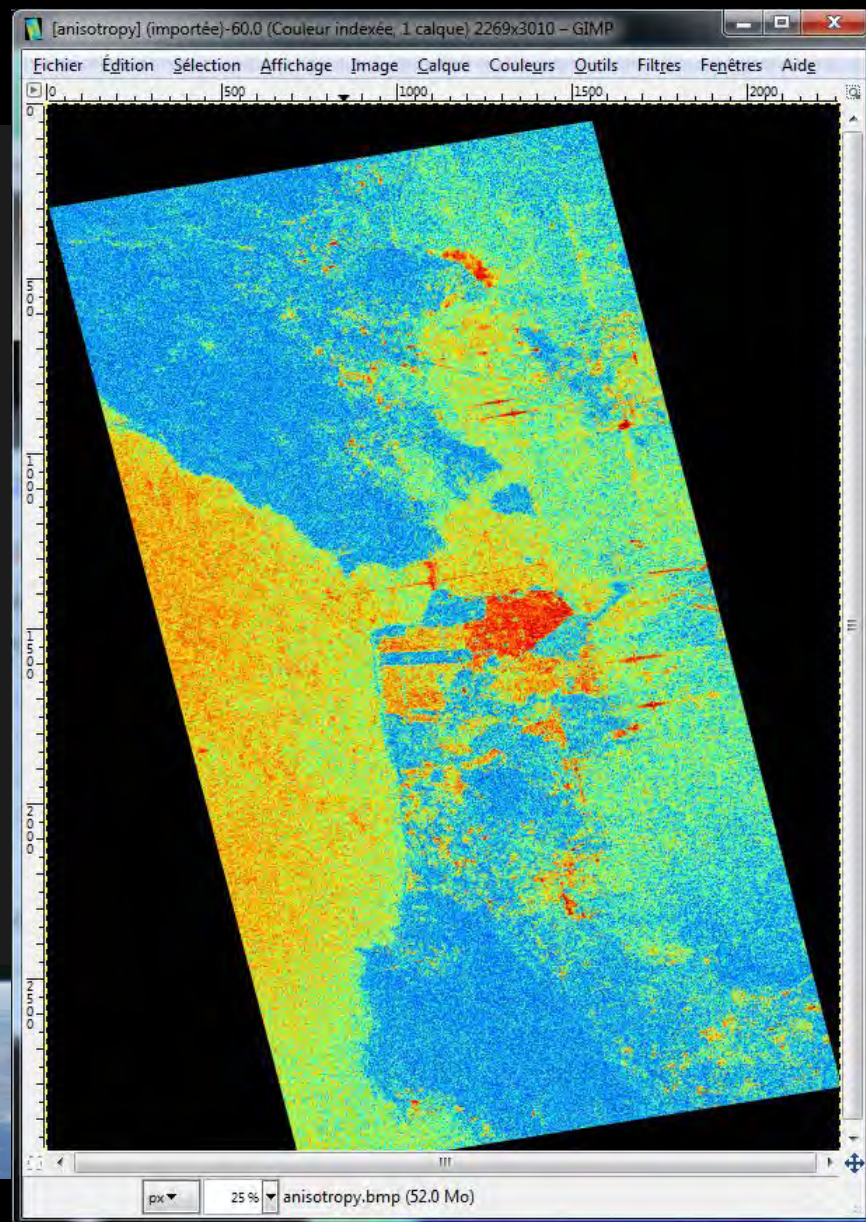
Alpha



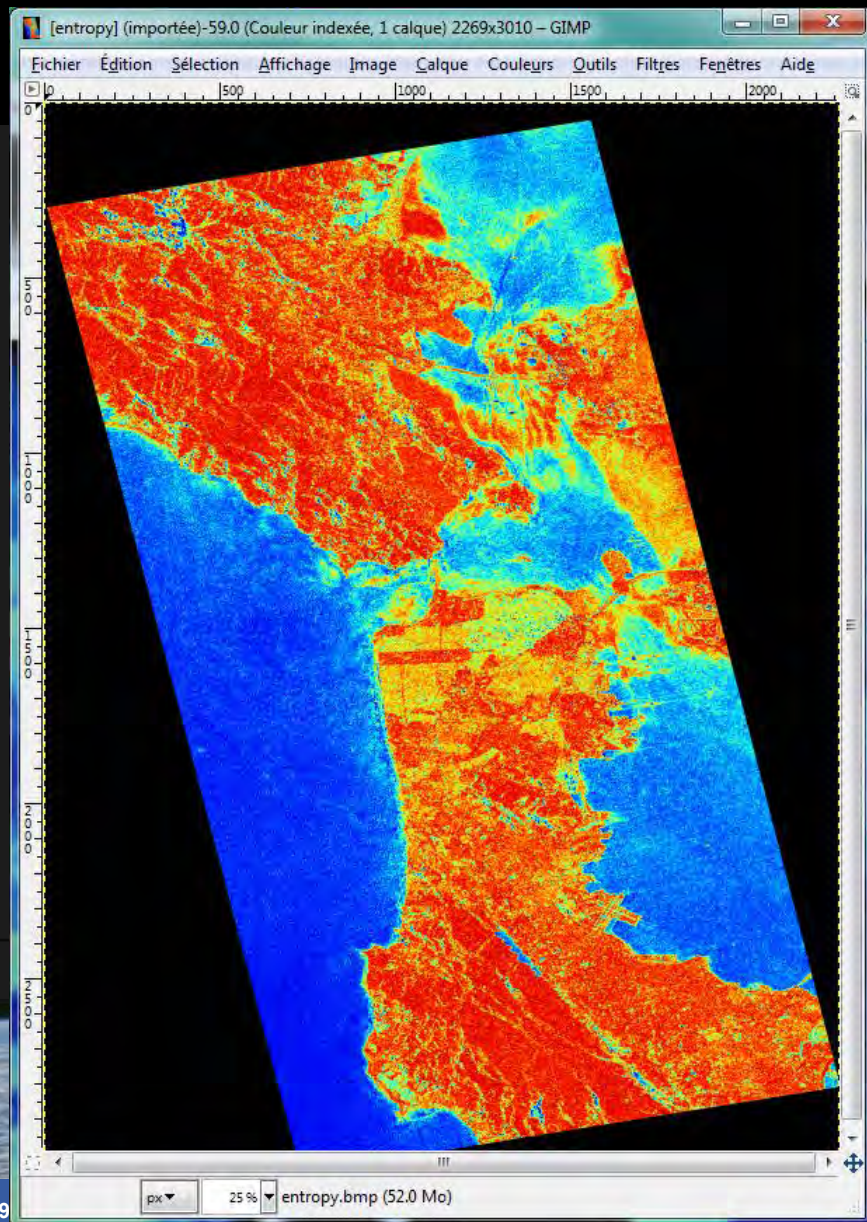
Lambda



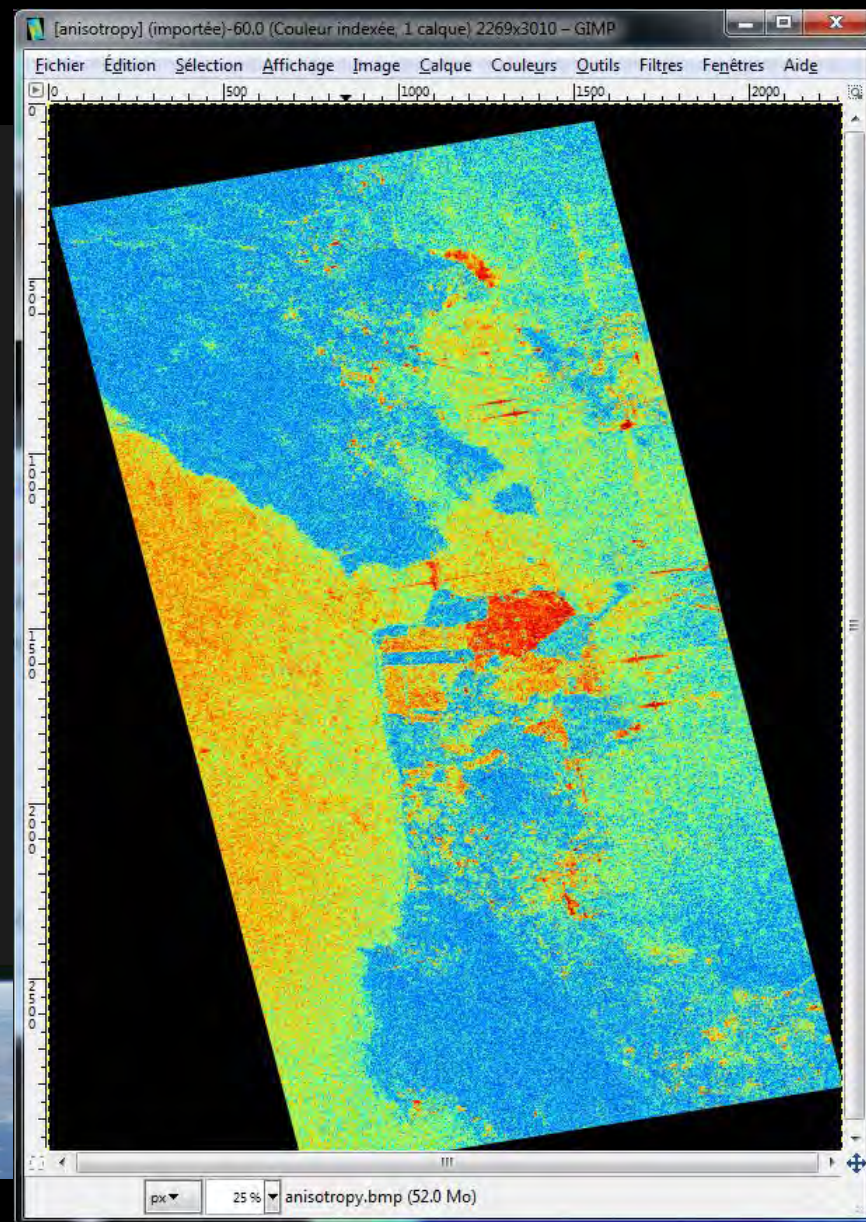
Anisotropy



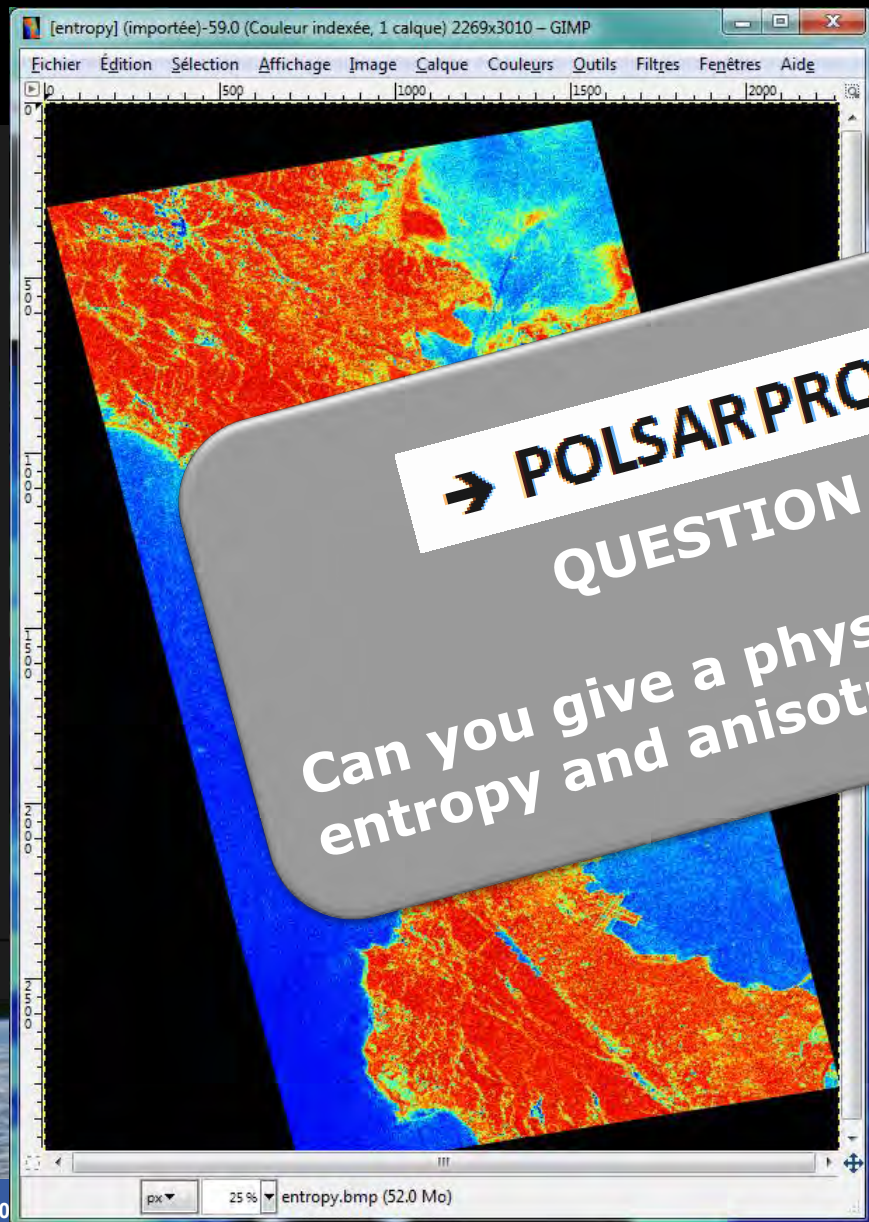
Entropy



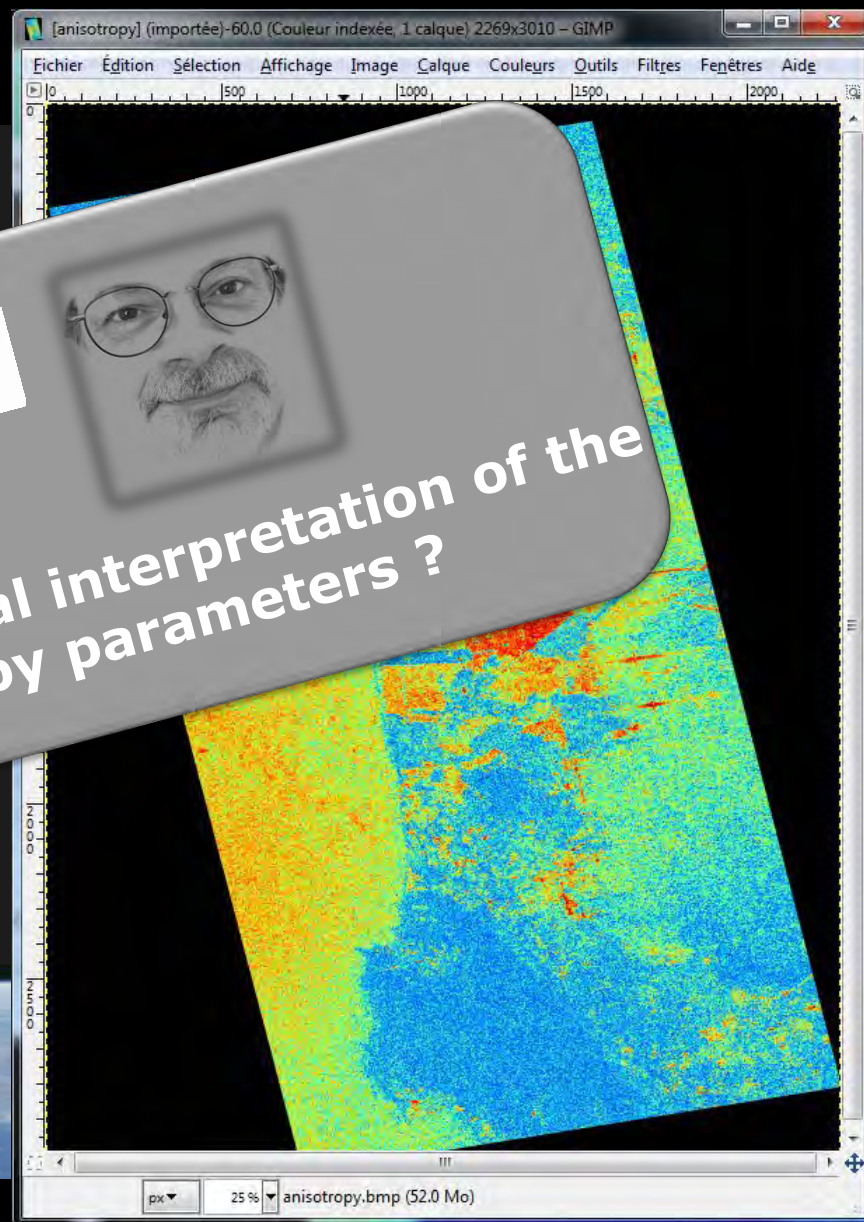
Anisotropy



Entropy



Anisotropy



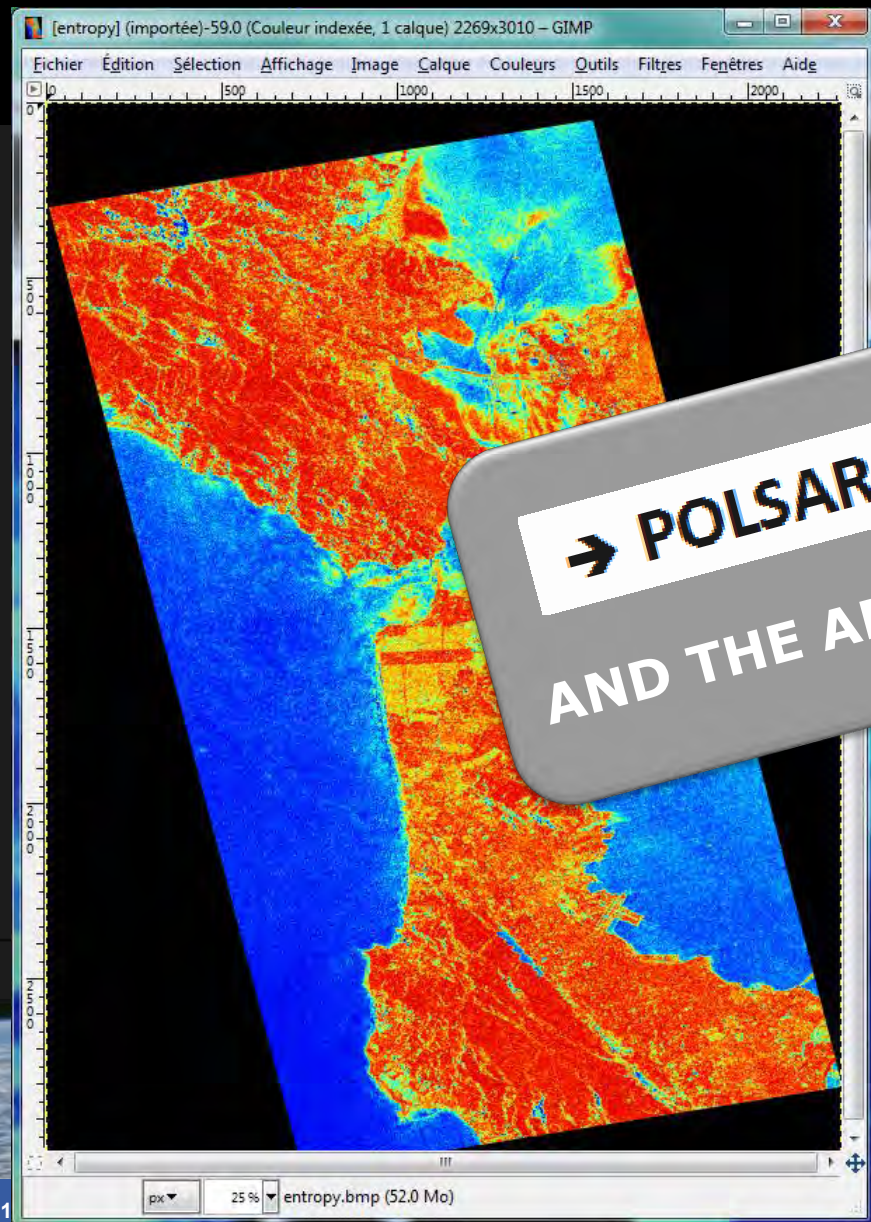
→ **POLSARPROF**

QUESTION :

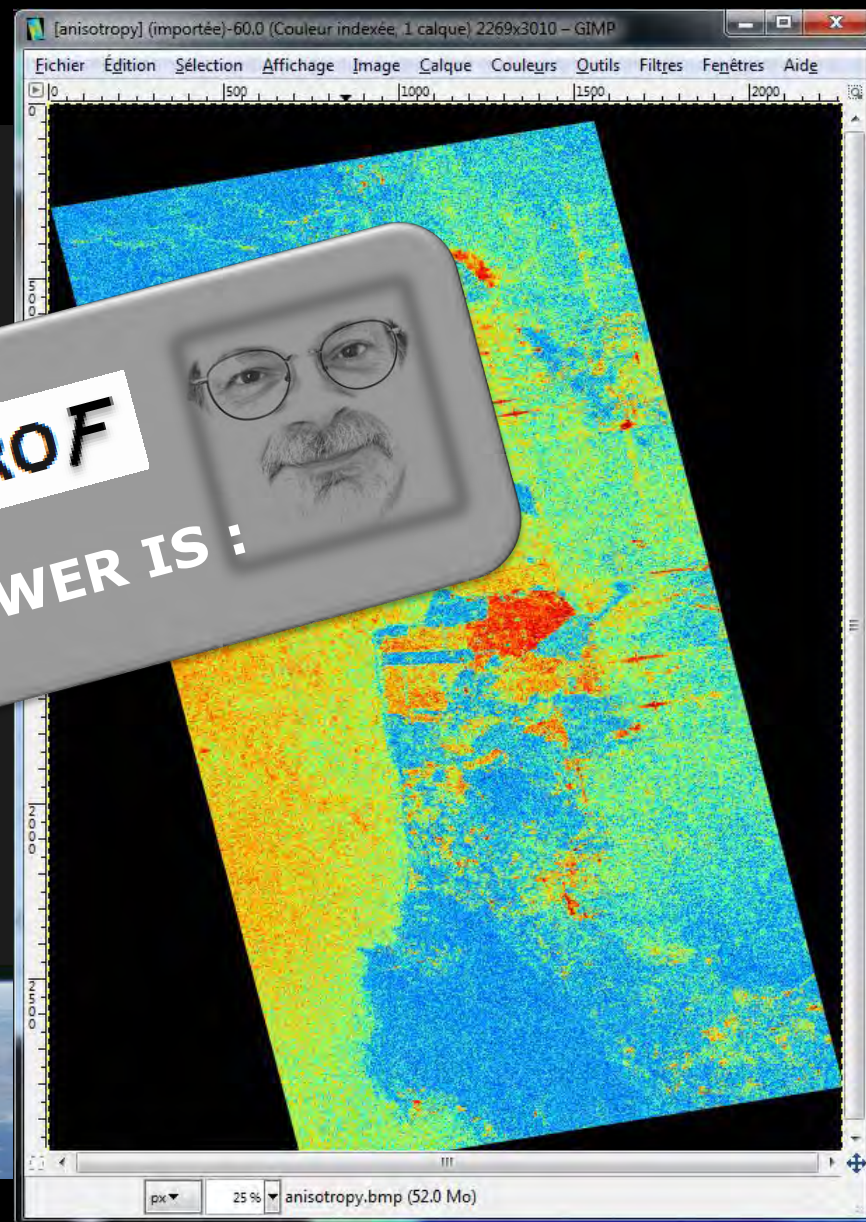
Can you give a physical interpretation of the entropy and anisotropy parameters ?



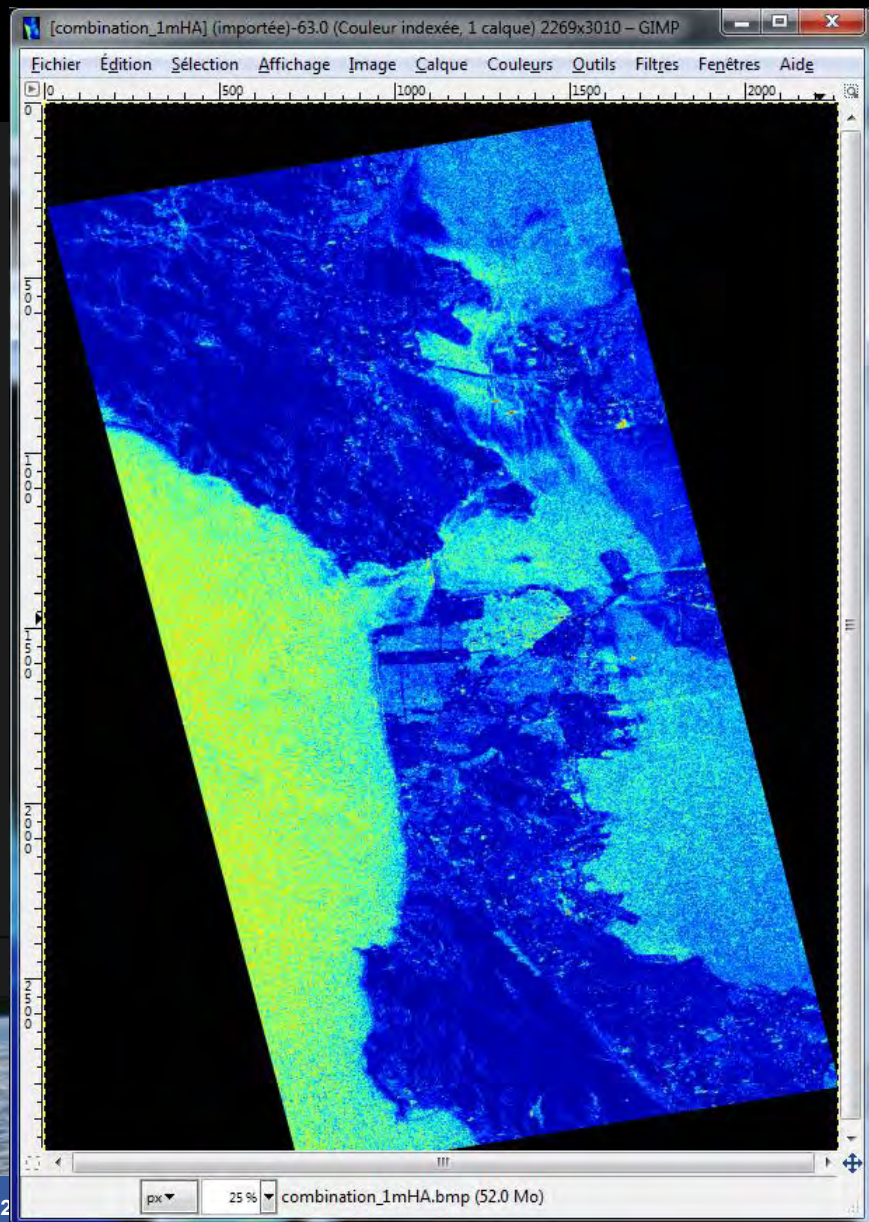
Entropy



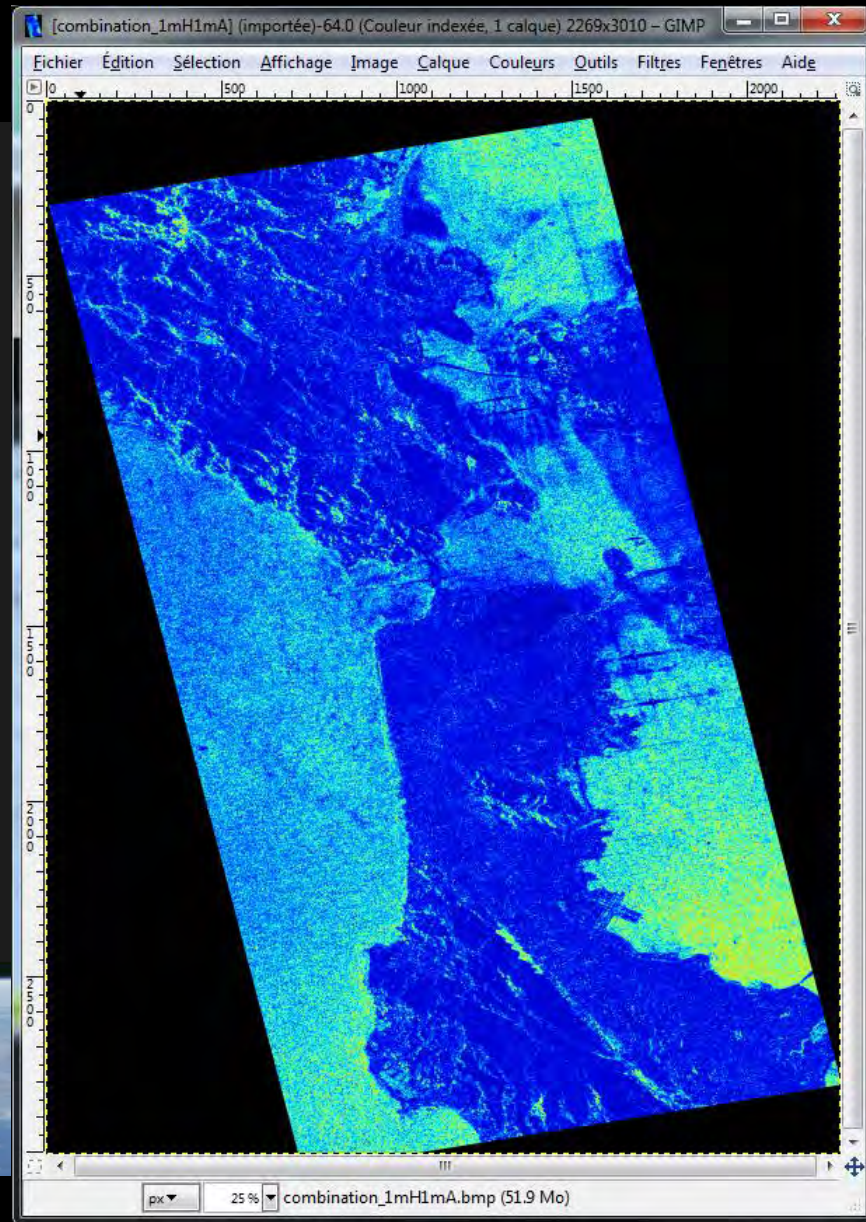
Anisotropy



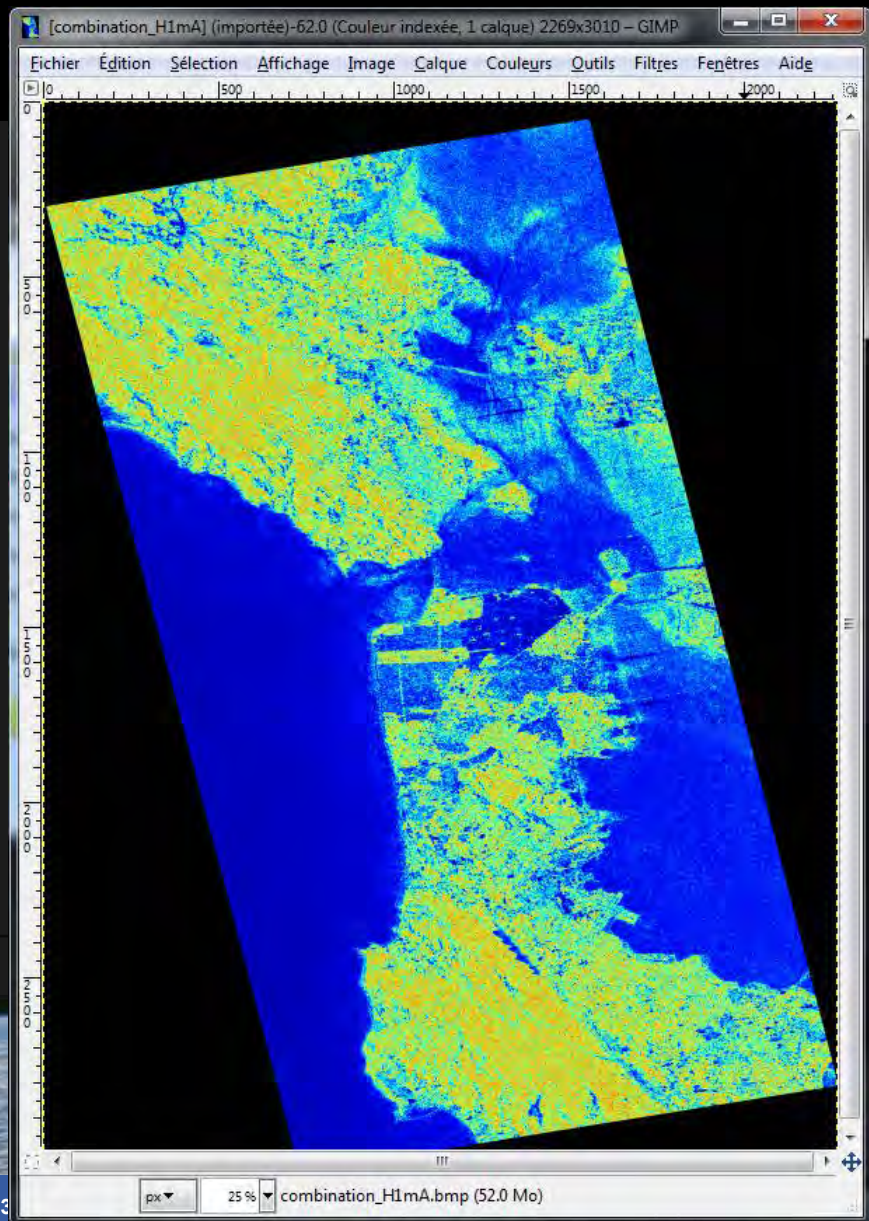
(1-H) A



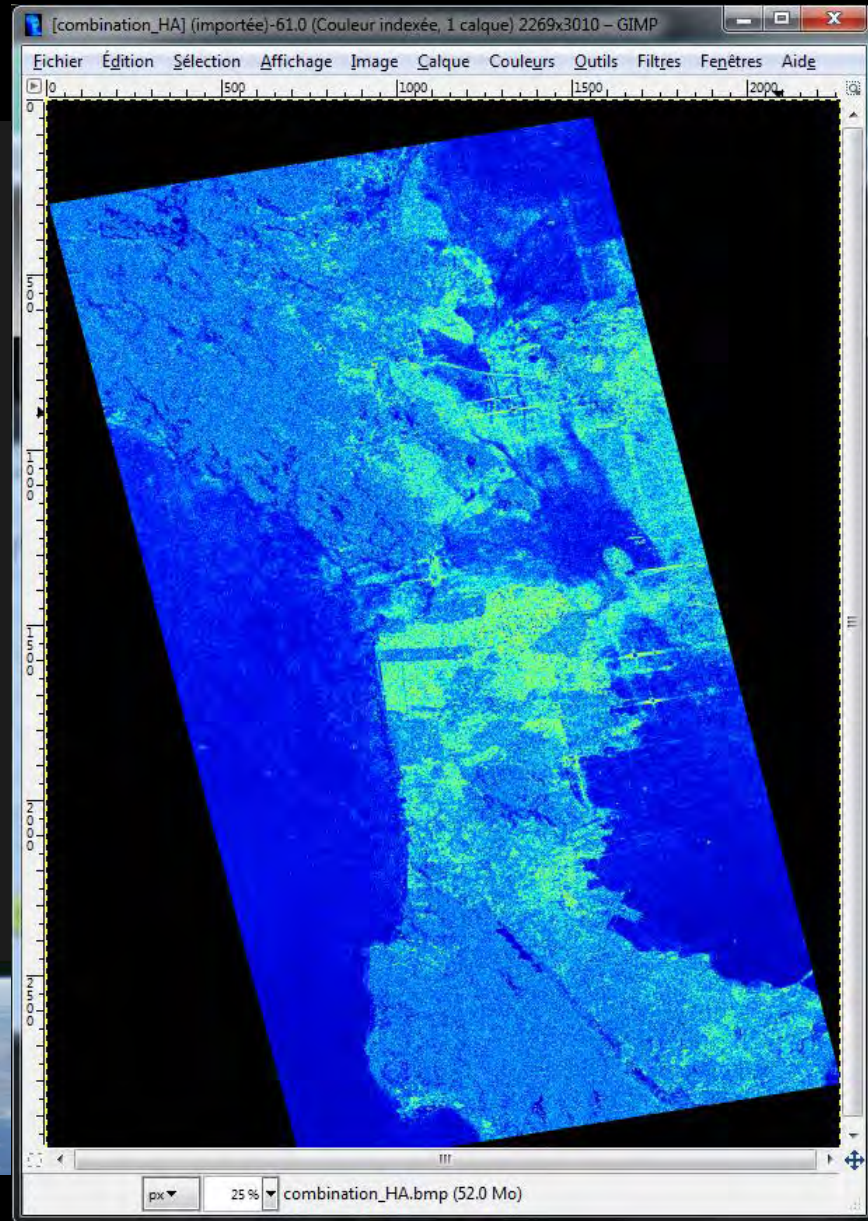
(1-H) (1-A)



H (1-A)

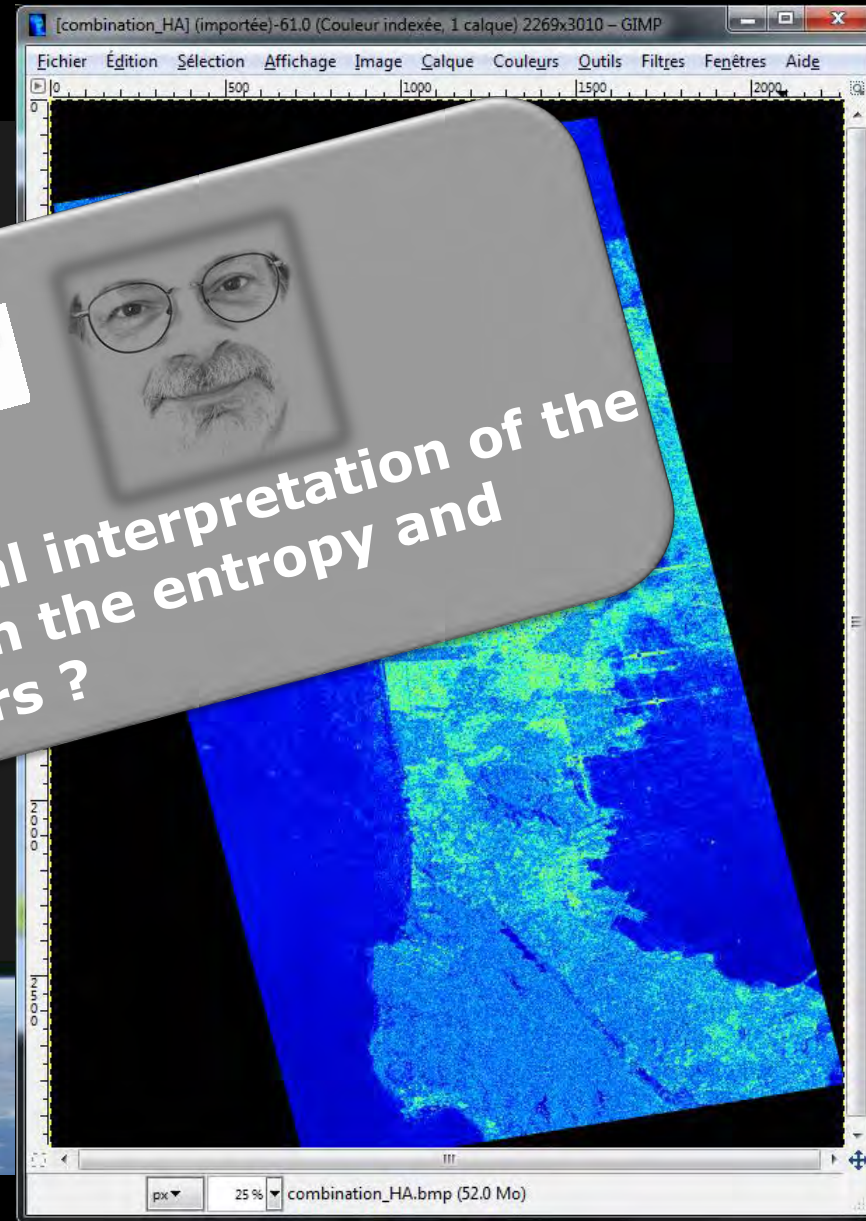
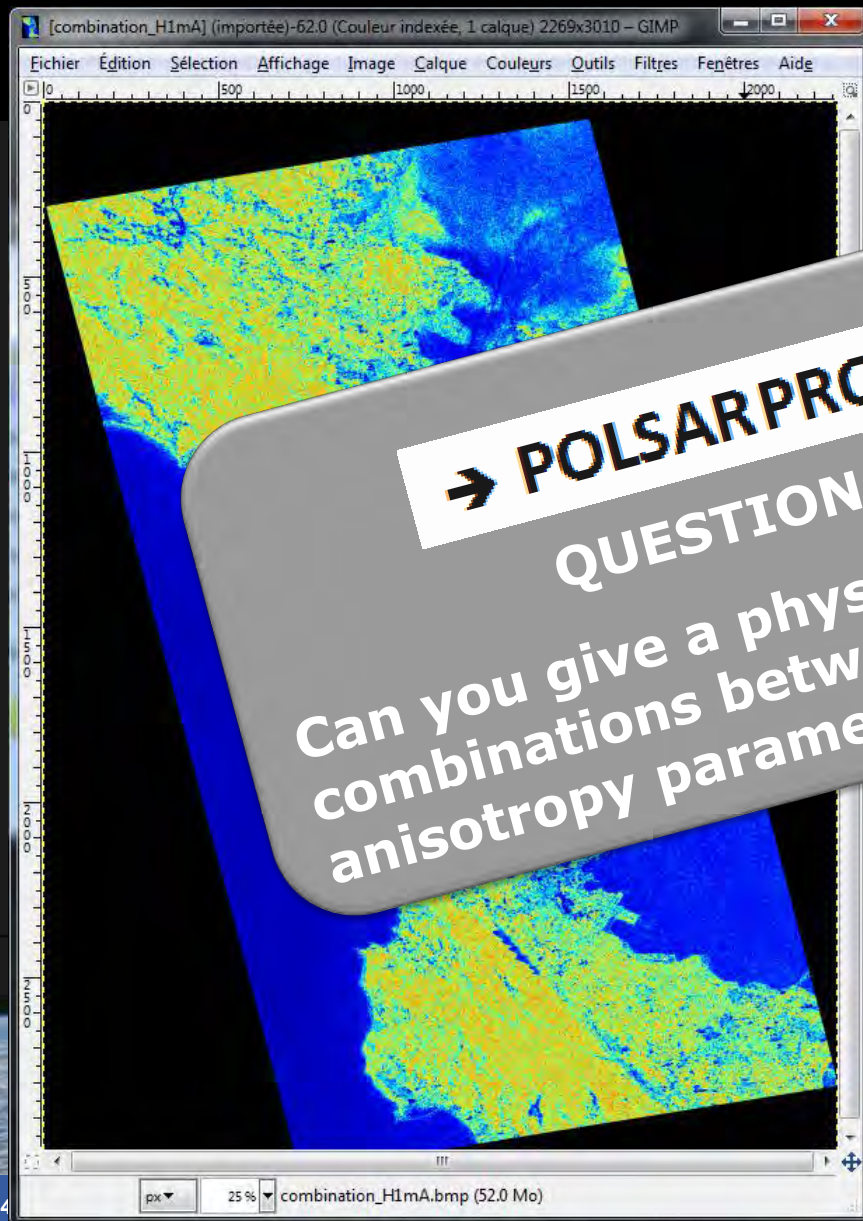


HA



H (1-A)

HA



→ **POLSARPROF**

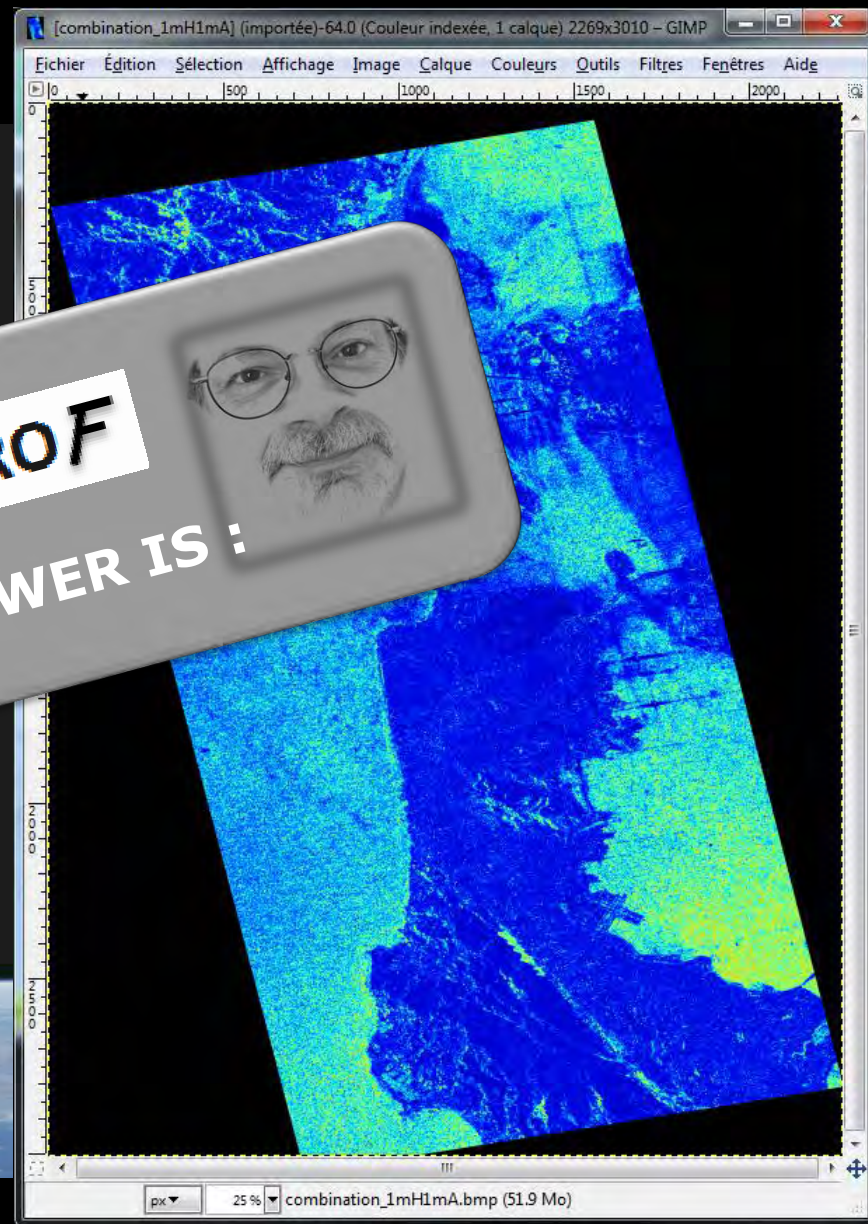
QUESTION :

Can you give a physical interpretation of the combinations between the entropy and anisotropy parameters ?



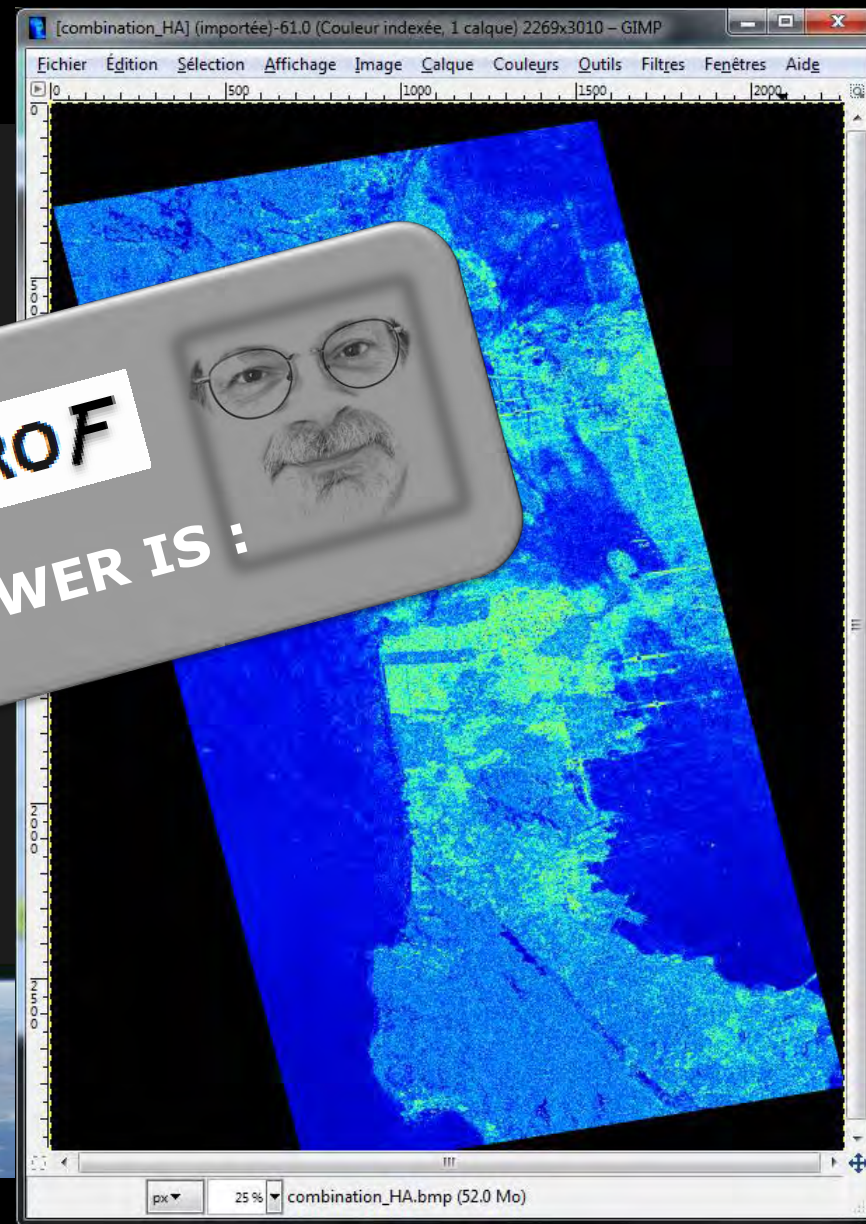
$(1-H) A$

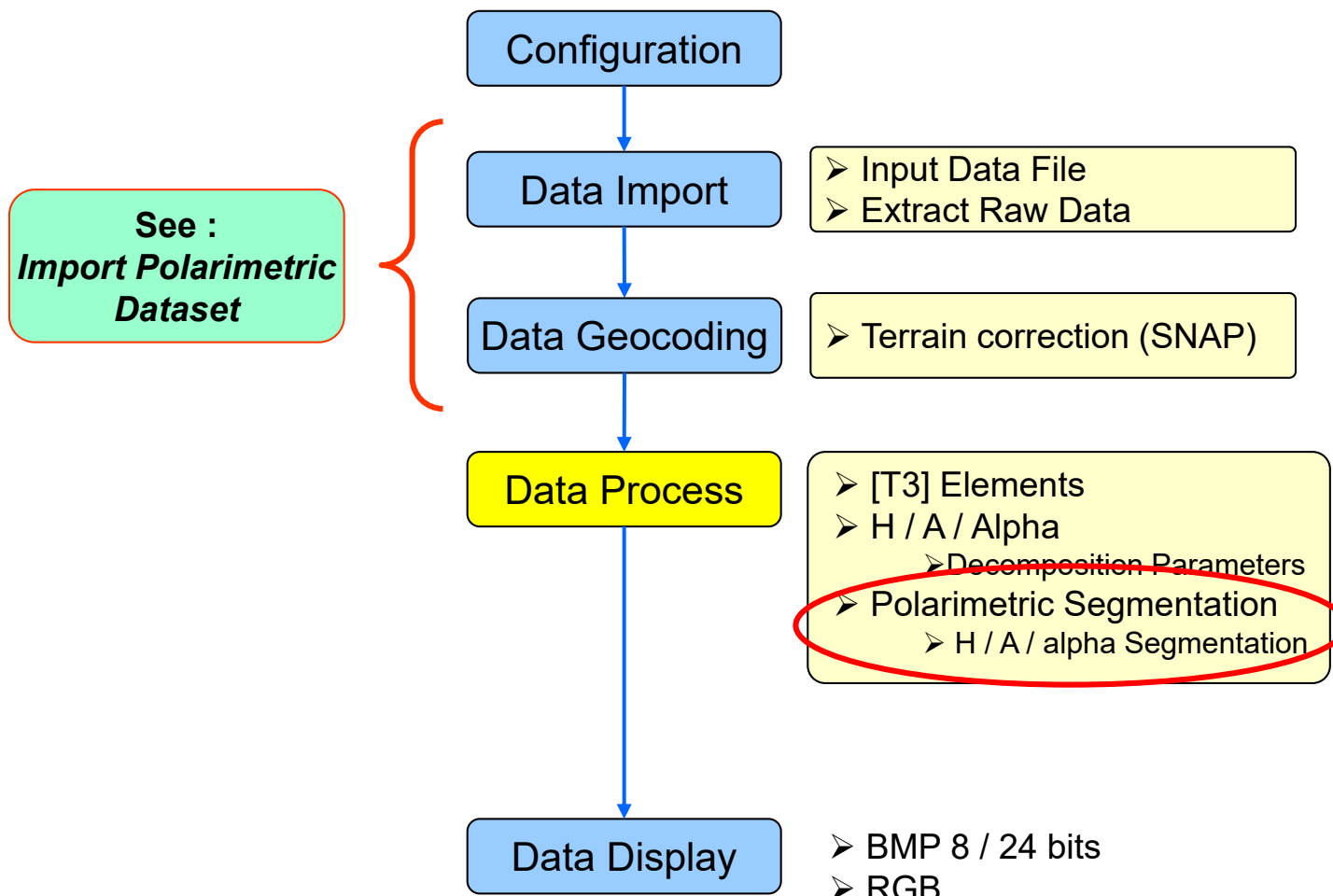
$(1-H) (1-A)$

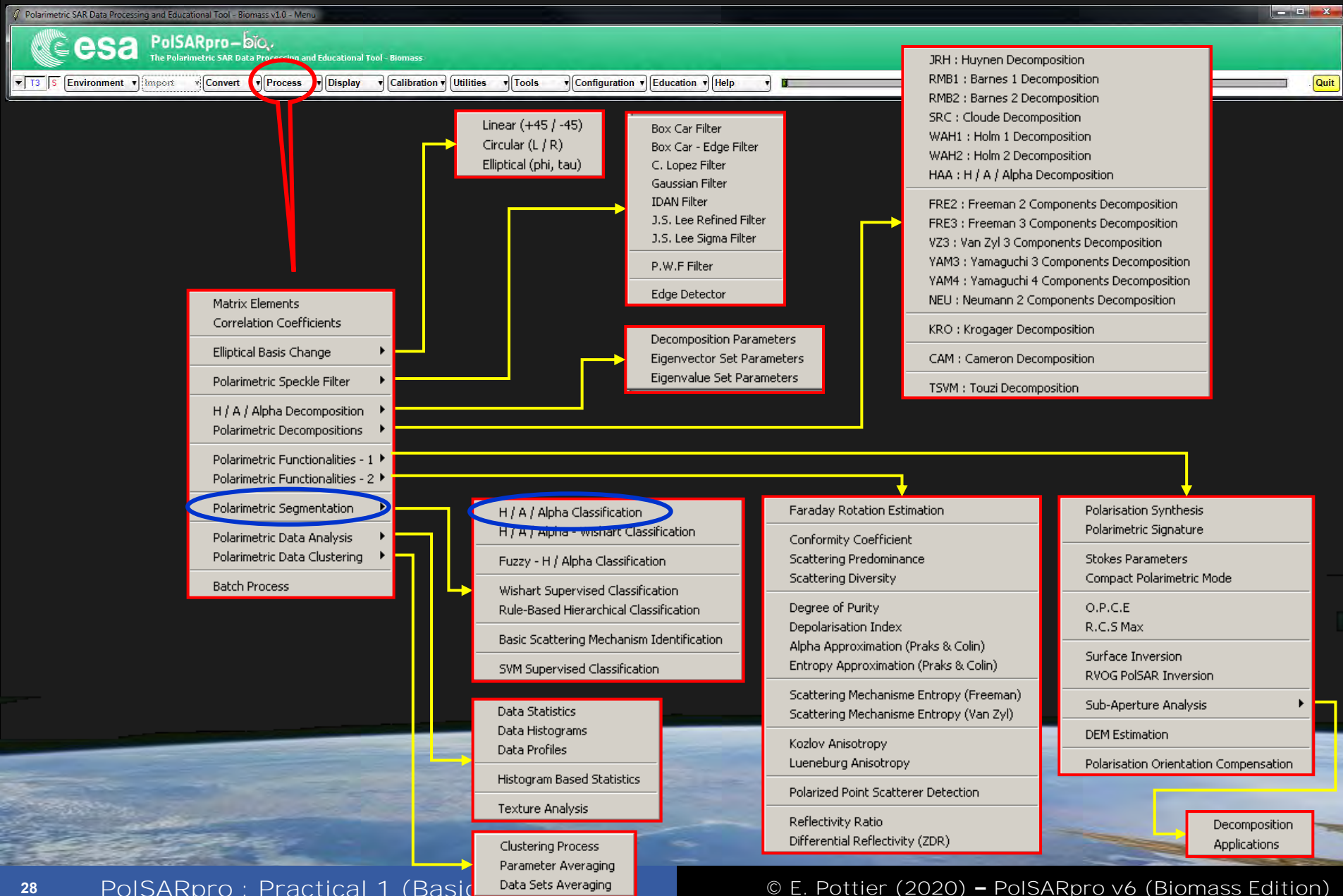


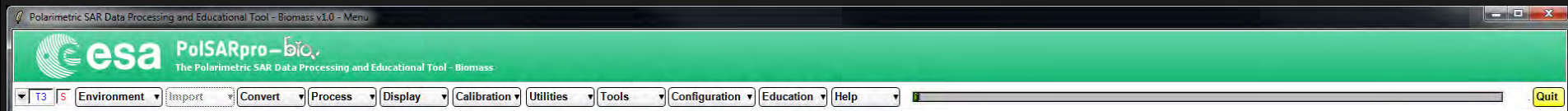
H (1-A)

HA







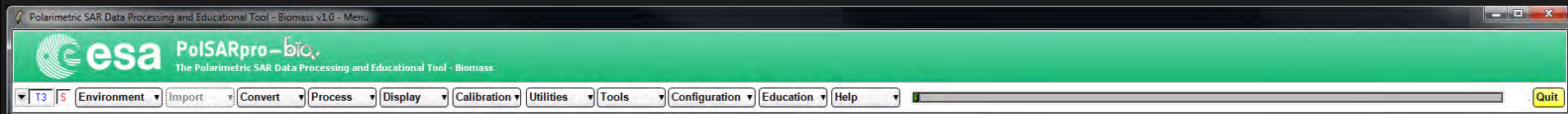


Do it Yourself:

Select some elements, set the parameters ($N_{win} = 3$) and view the corresponding BMP files.



H / A / alpha CLASSIFICATION



DATADIR

config.txt

[T3x3] Elements



H_A_class.bin, H_Alpha_class.bin, A_Alpha_class.bin

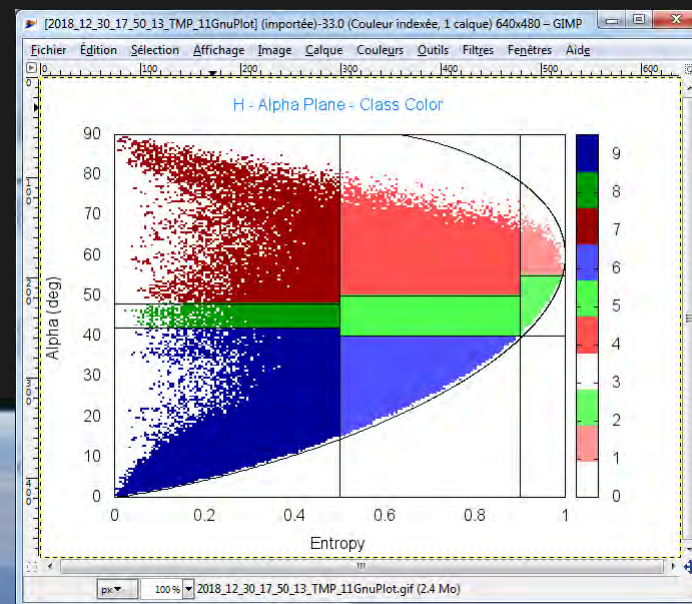
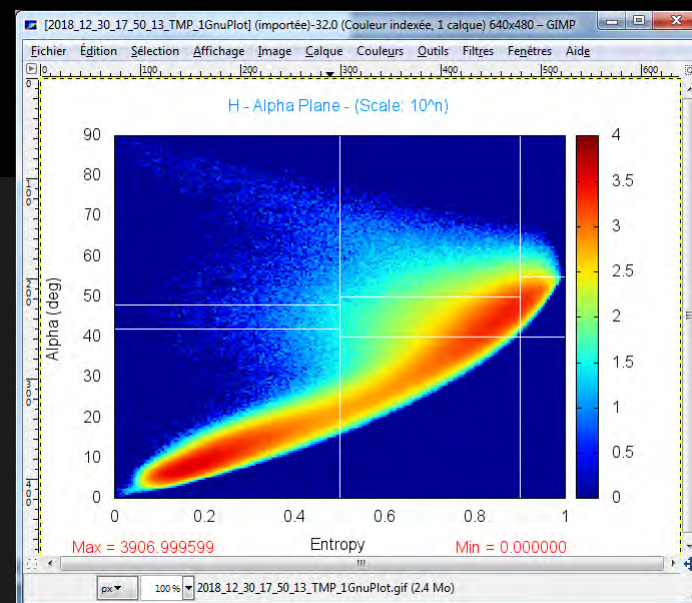
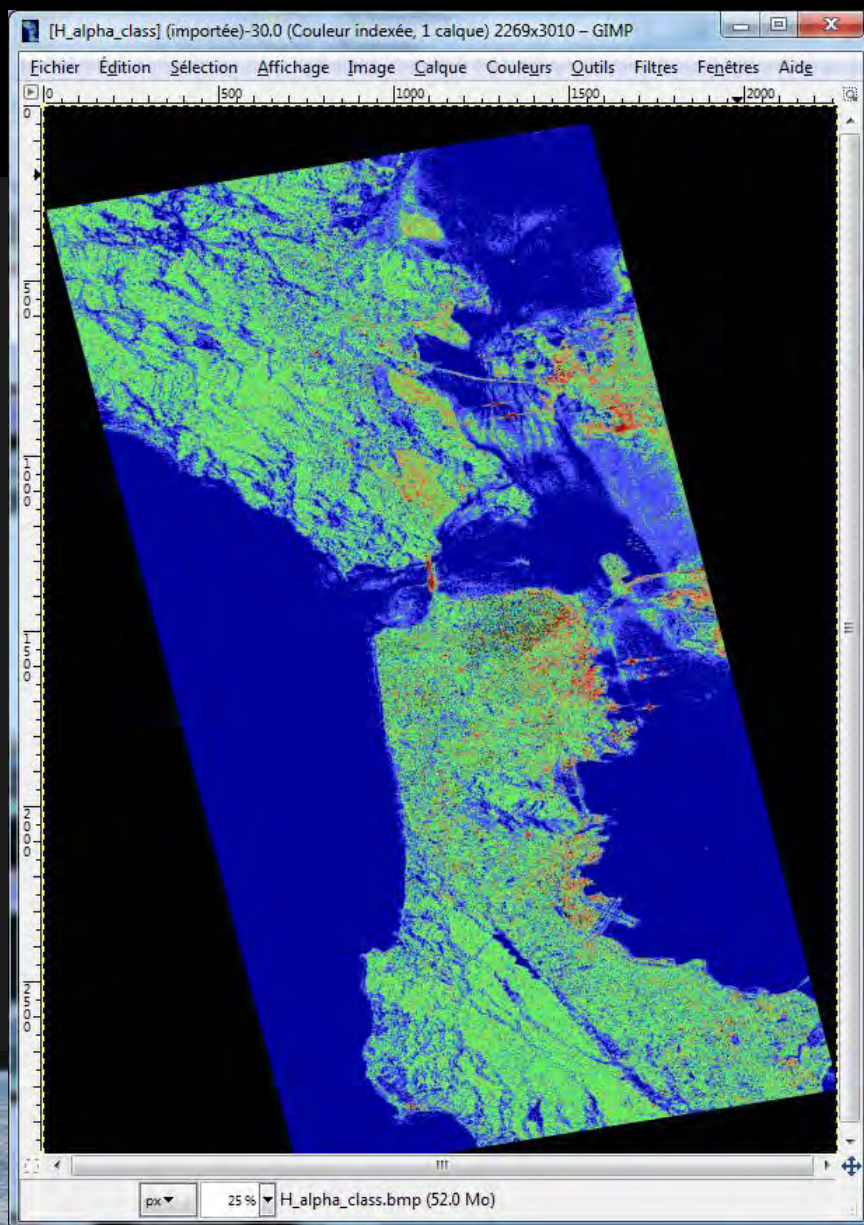


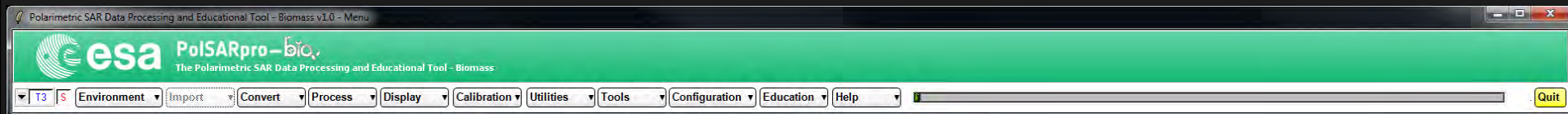
H_A_class.bmp, H_Alpha_class.bmp, A_Alpha_class.bmp
H_A_occurrence.bmp, H_Alpha_occurrence.bmp,
A_Alpha_occurrence.bmp, H_A_segmented.bmp,
H_Alpha_segmented.bmp, A_Alpha_segmented.bmp
HAlphaLambda_RGB.bmp, HAlpha_RGB.bmp
HACombinations_RGB.bmp

Do it Yourself:

Select some elements, set the parameters ($N_{win} = 3$) and view the corresponding BMP files.

H / A / alpha CLASSIFICATION



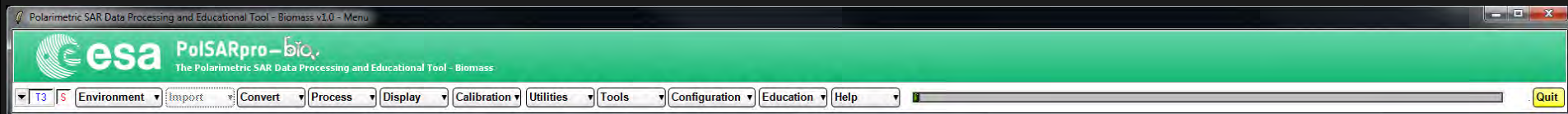


Do it Yourself:

Select some elements, set the parameters ($N_{win} = 3$) and view the corresponding BMP files.



H / A / alpha CLASSIFICATION



Do it Yourself:

Select some elements, set the parameters ($N_{win} = 3$) and view the corresponding BMP files.

DATADIR

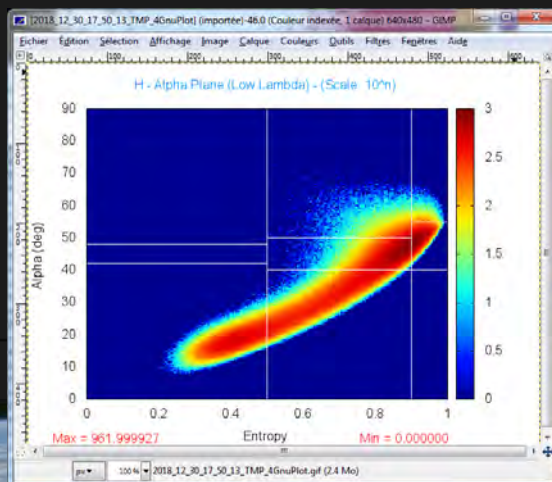
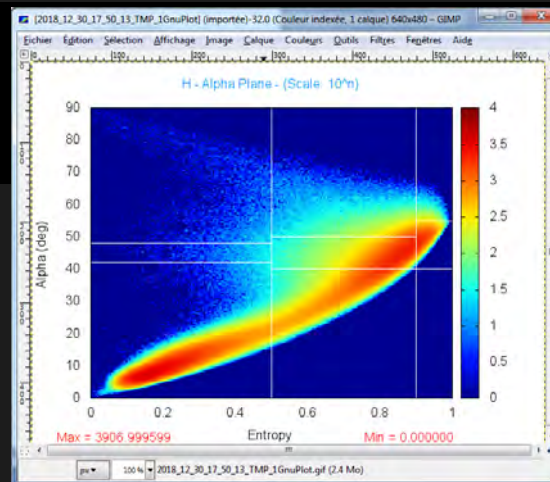
config.txt

[T3x3] Elements

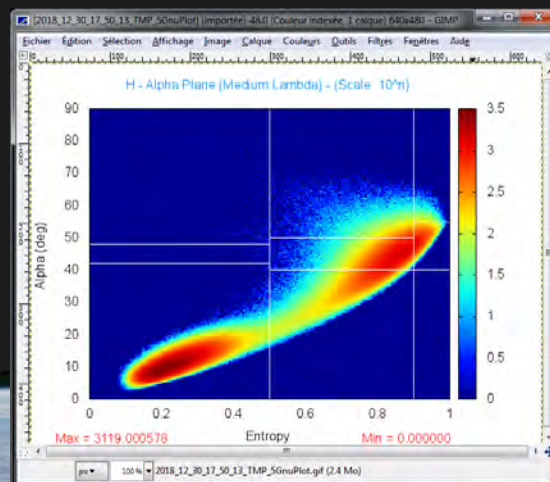
H_alpha_lambda_class1(2,3).bin,
H_alpha_lambda_occurrence_class1(2,3).bin,
H_alpha_lambda_segmented_class1(2,3).bin,
H_alpha_lambda_class.bin,

H_alpha_lambda_class1(2,3).bmp,
H_alpha_lambda_occurrence_class1(2,3).bmp,
H_alpha_lambda_segmented_class1(2,3).bmp,
H_alpha_lambda_class.bmp,

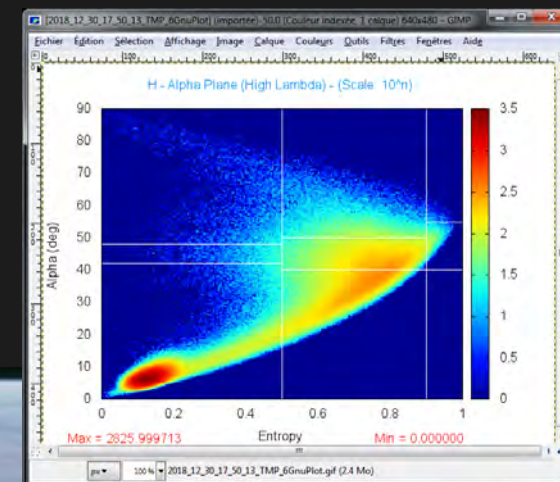
H / A / alpha CLASSIFICATION



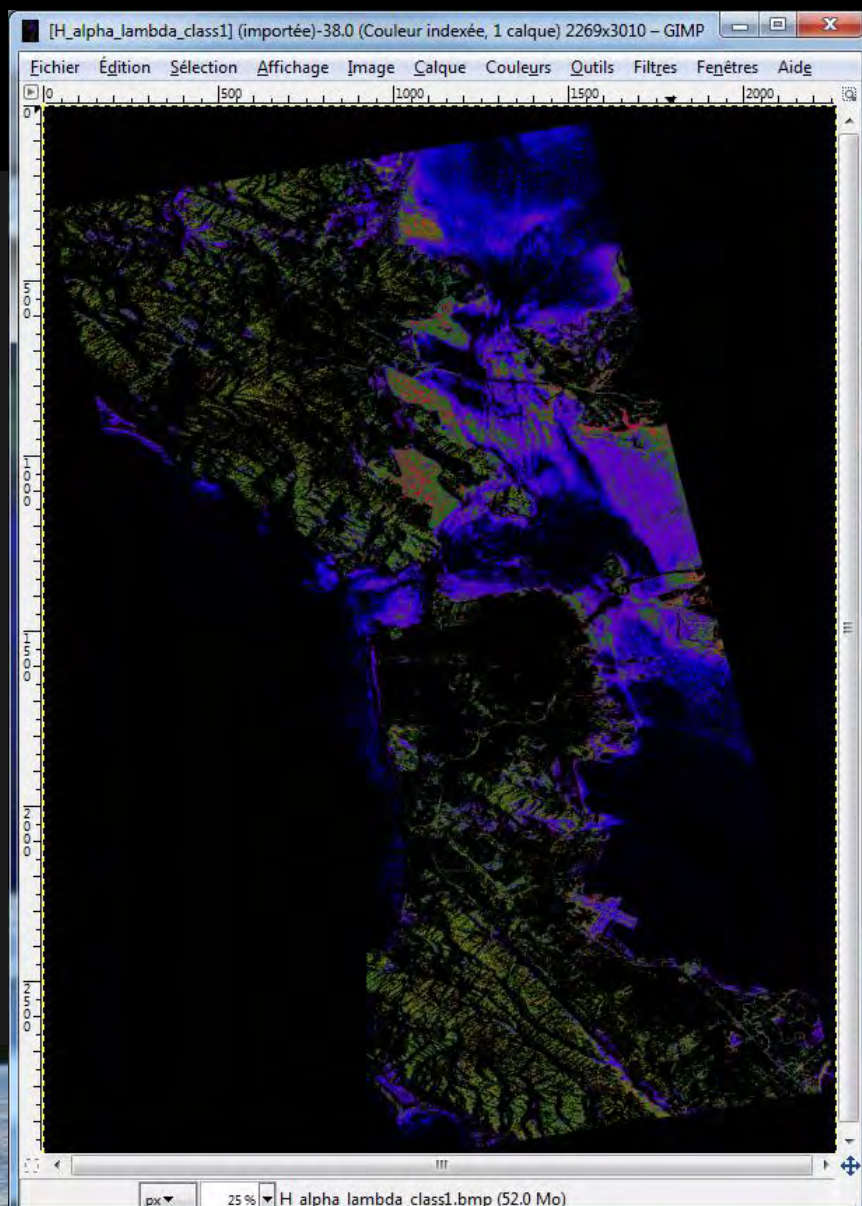
Low λ



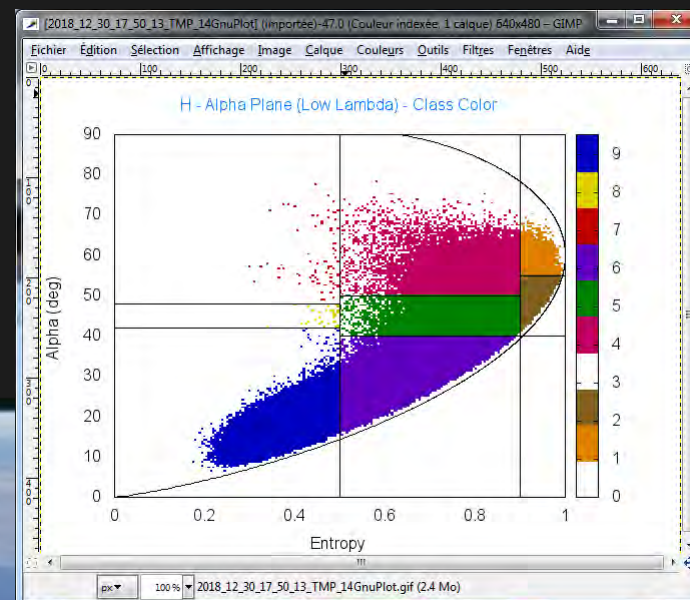
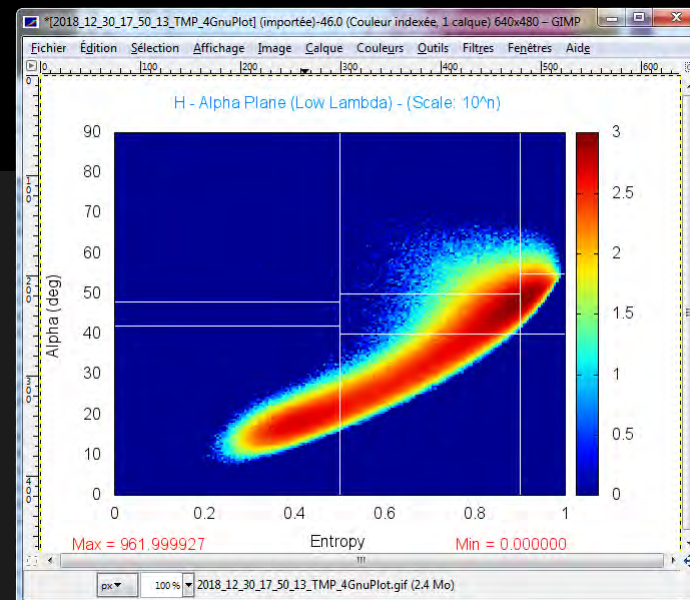
Medium λ

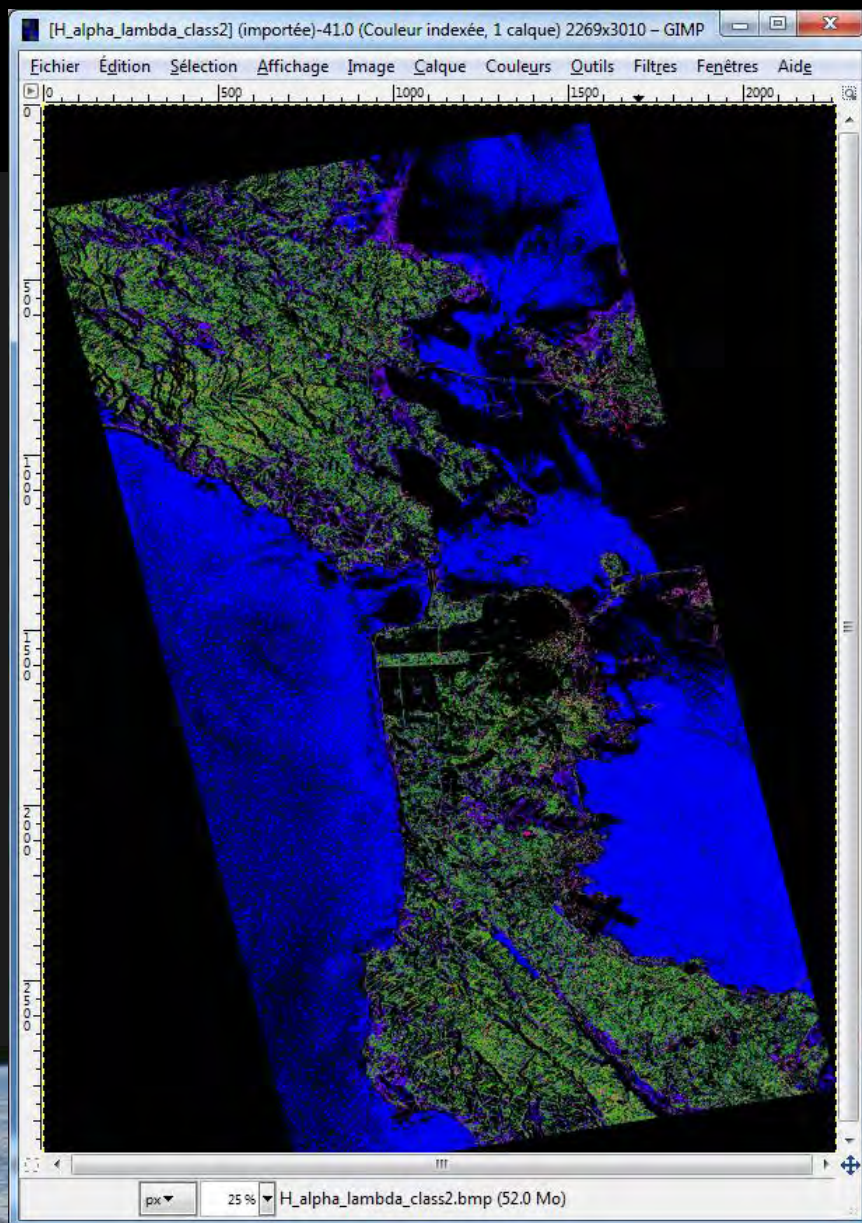


High λ

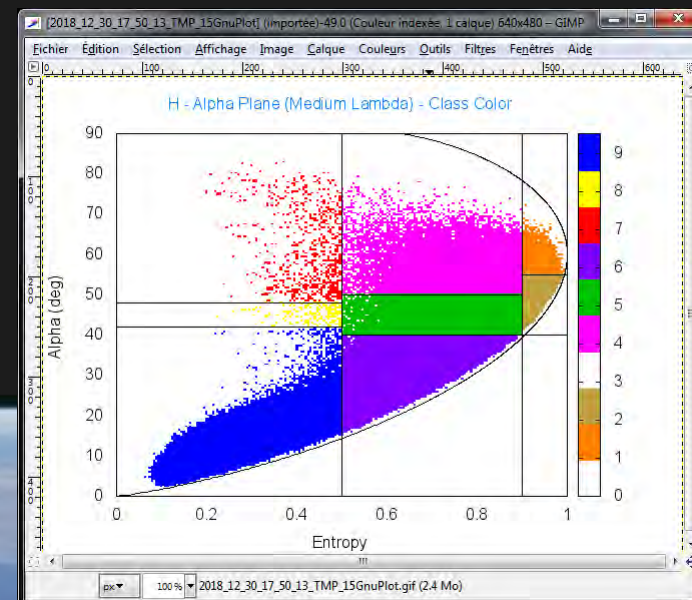
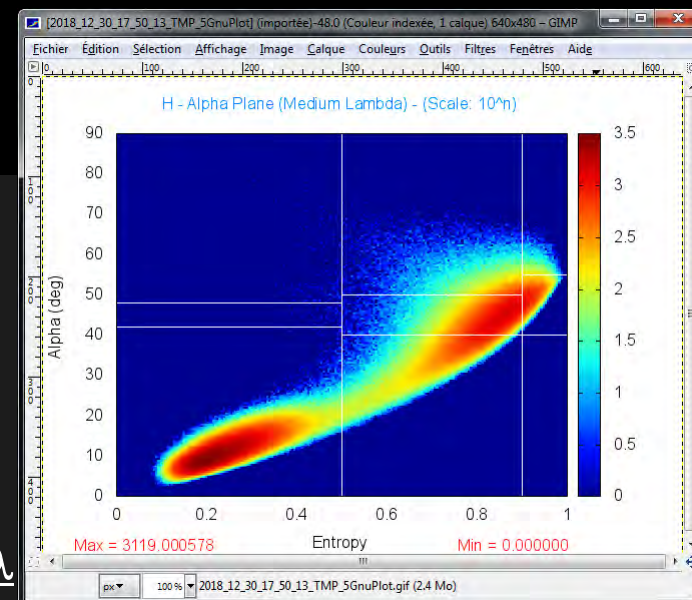


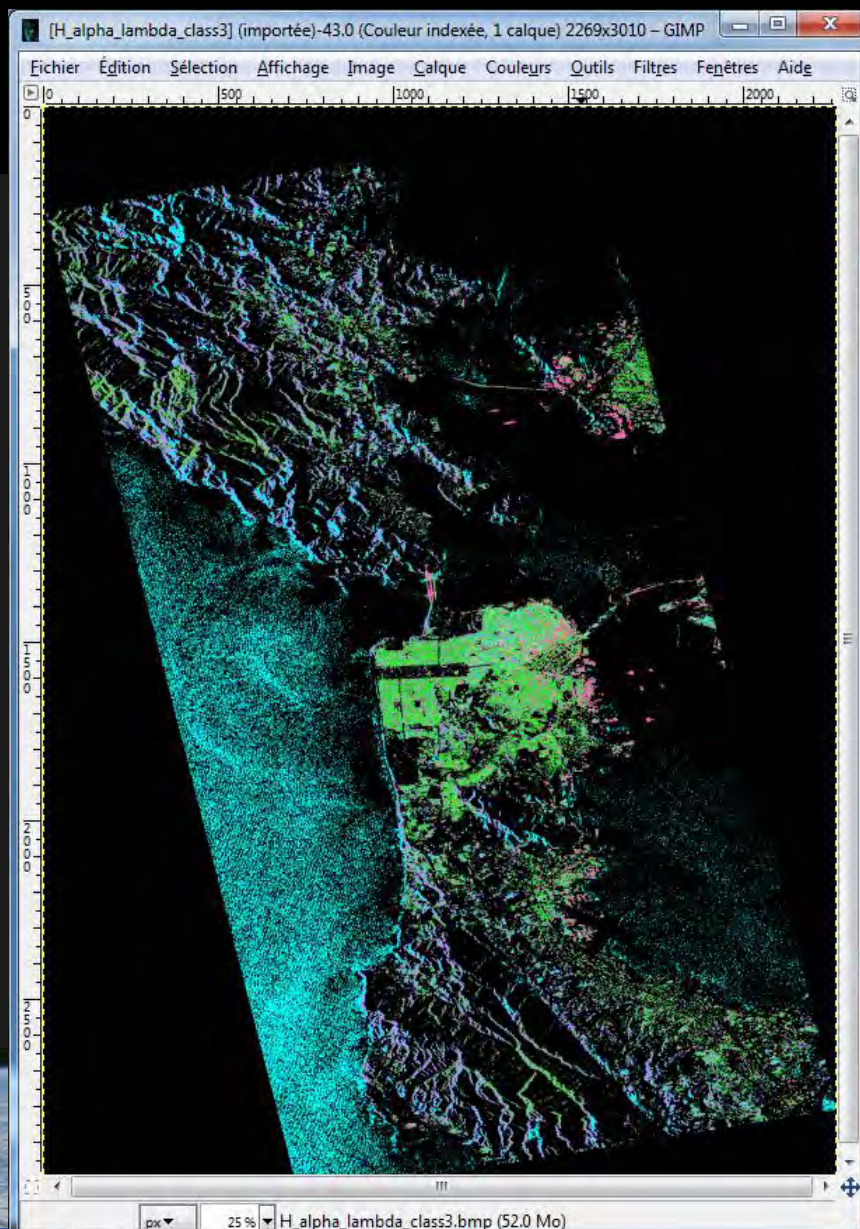
Low λ



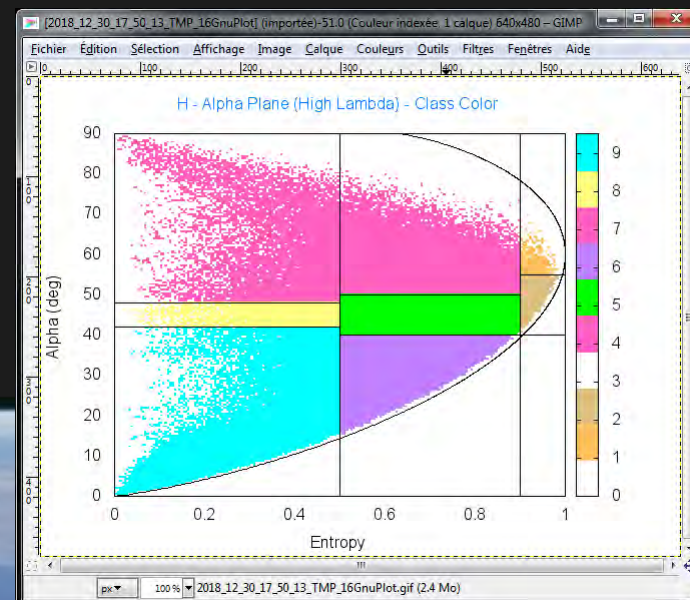
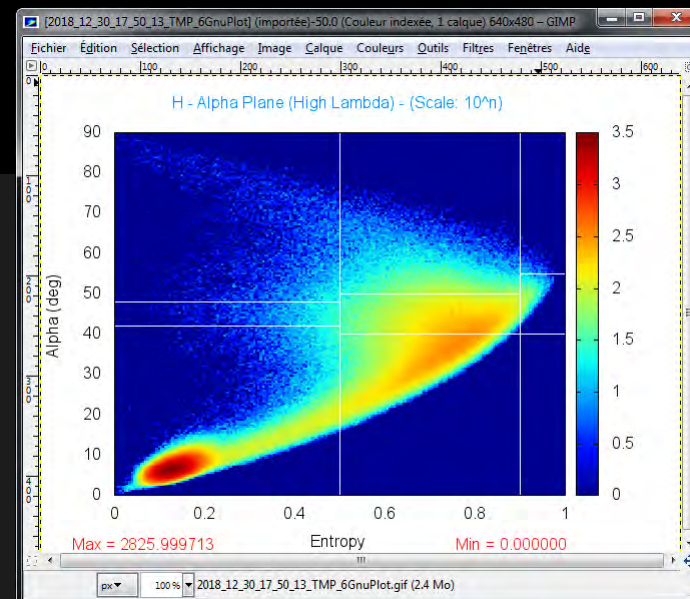


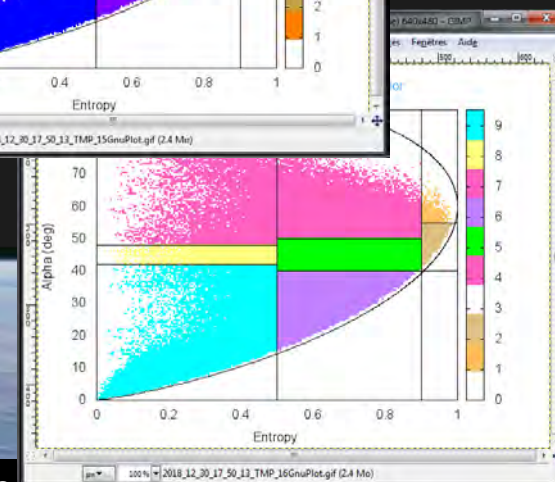
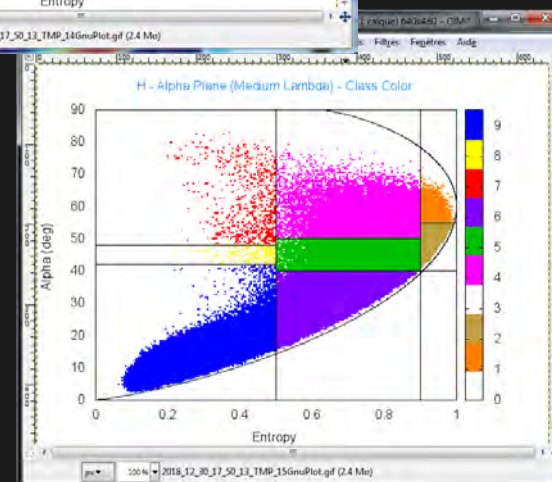
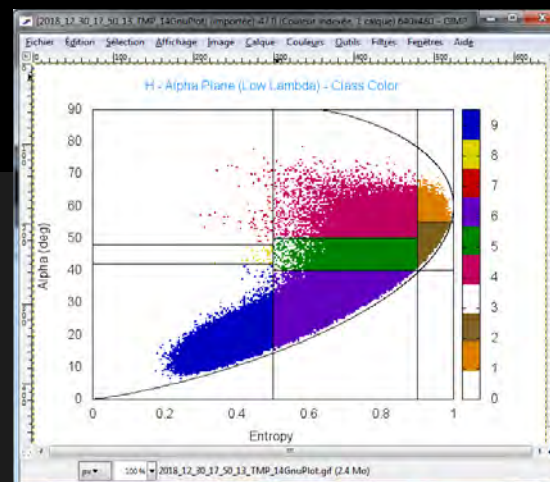
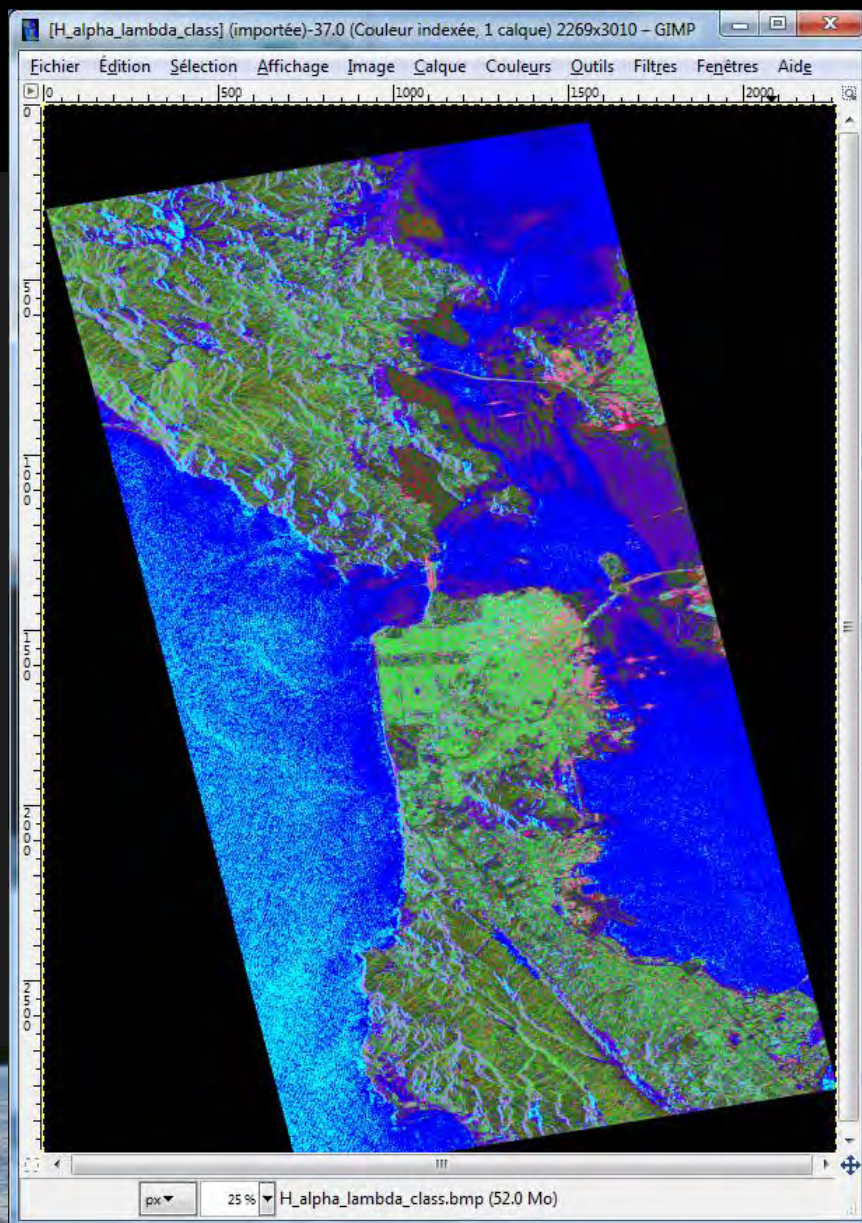
Medium λ

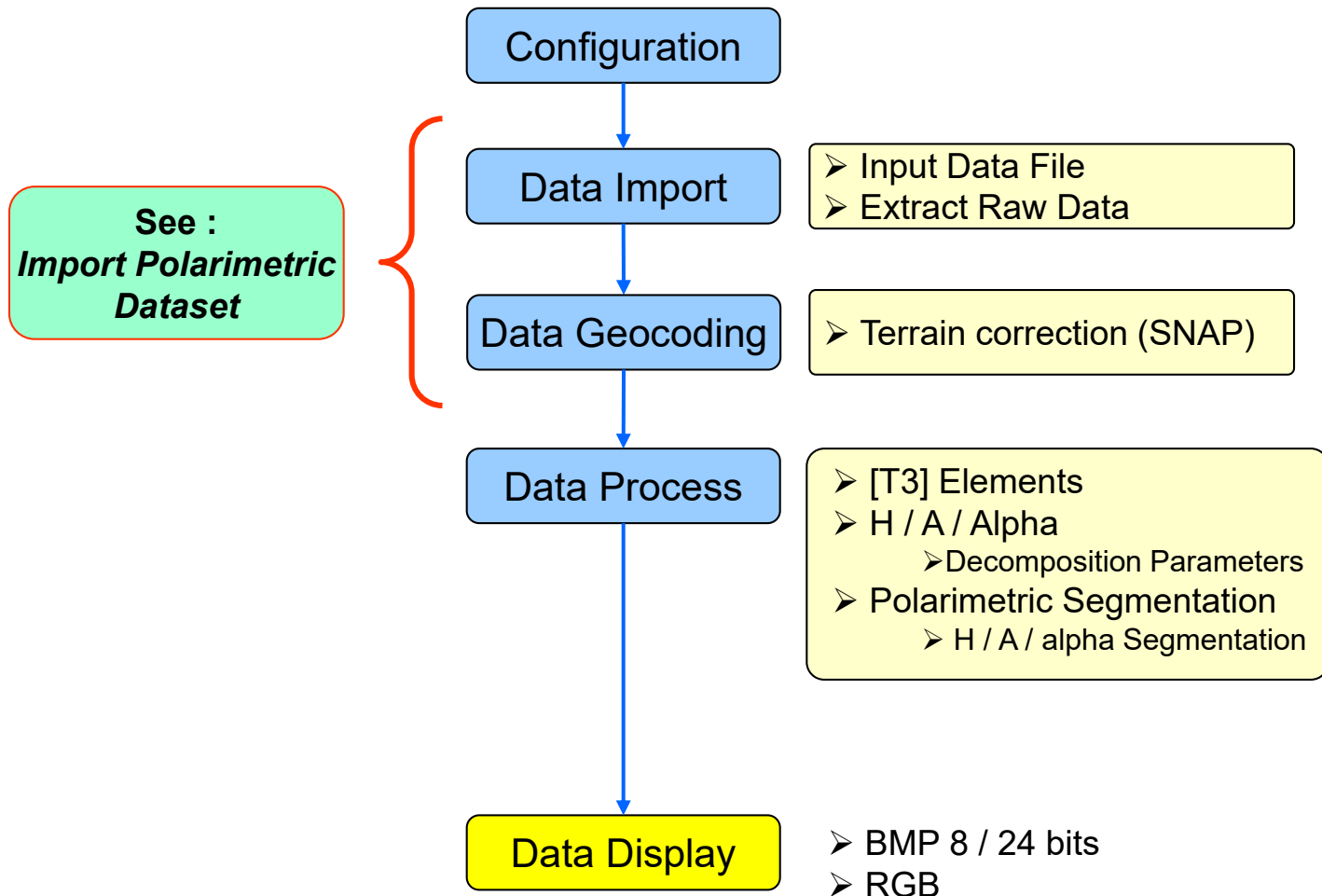


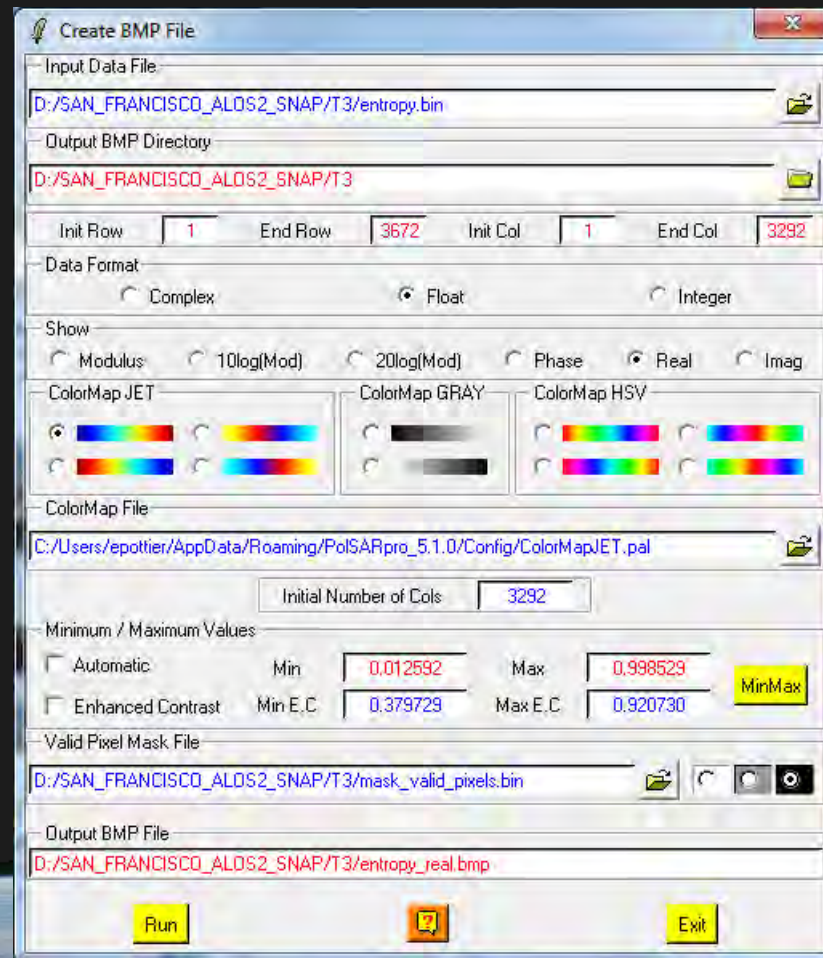
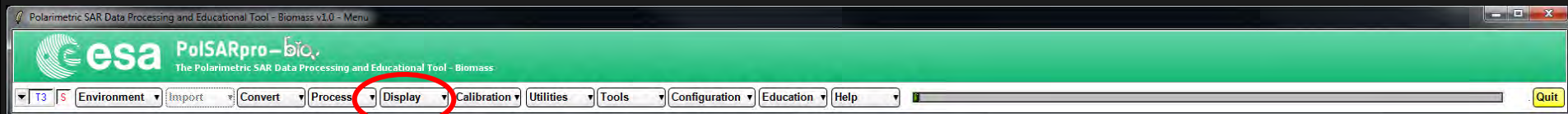


High λ

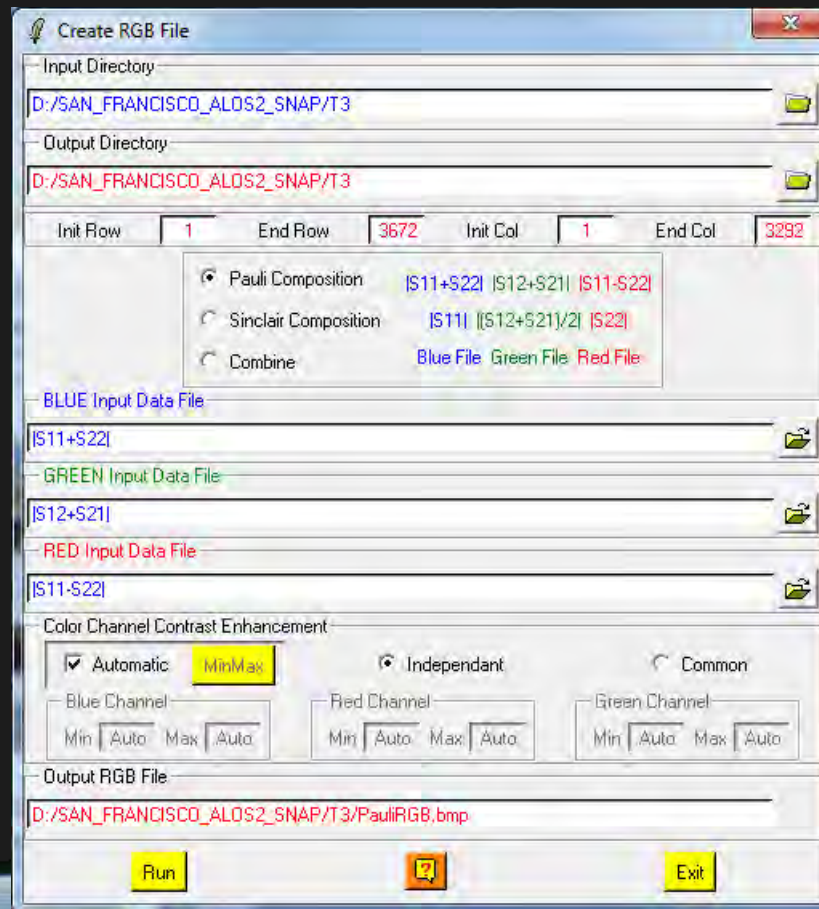
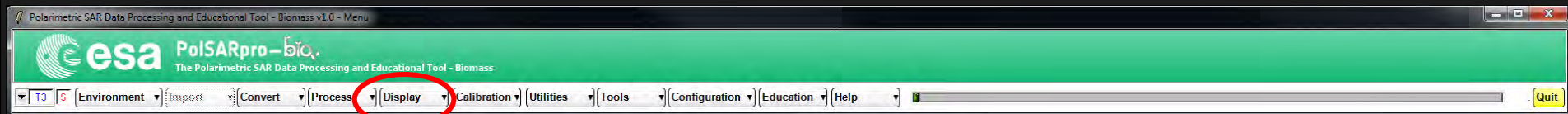




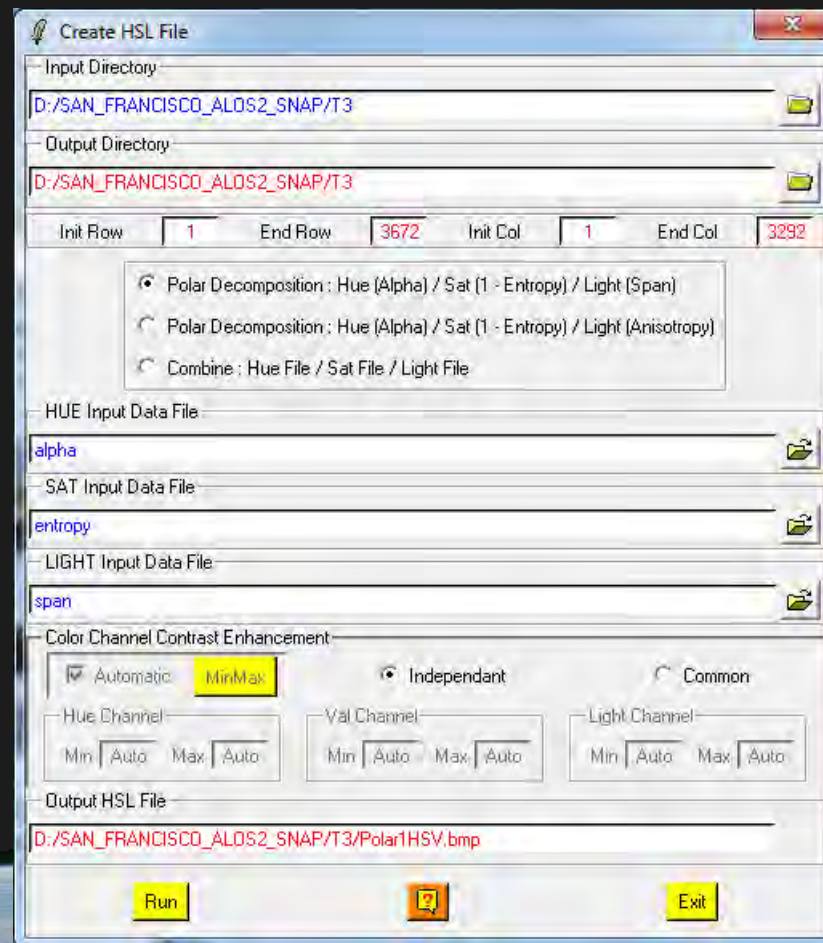
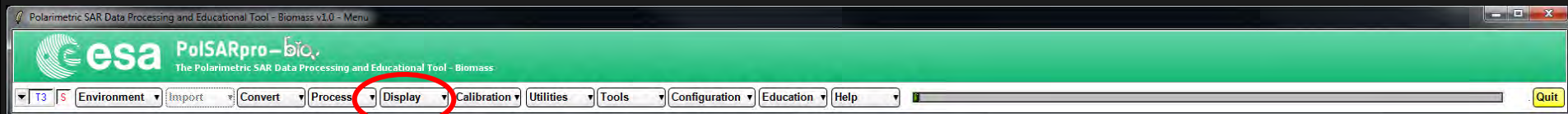




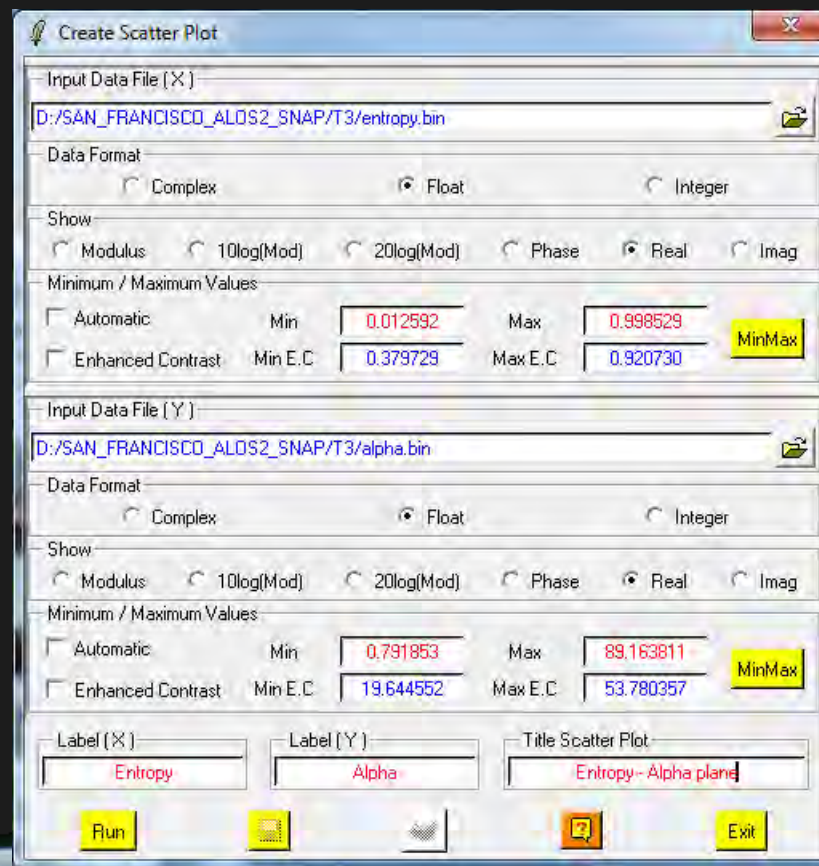
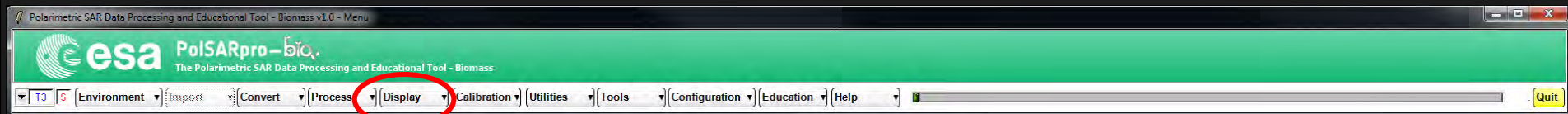
Create BMP Image



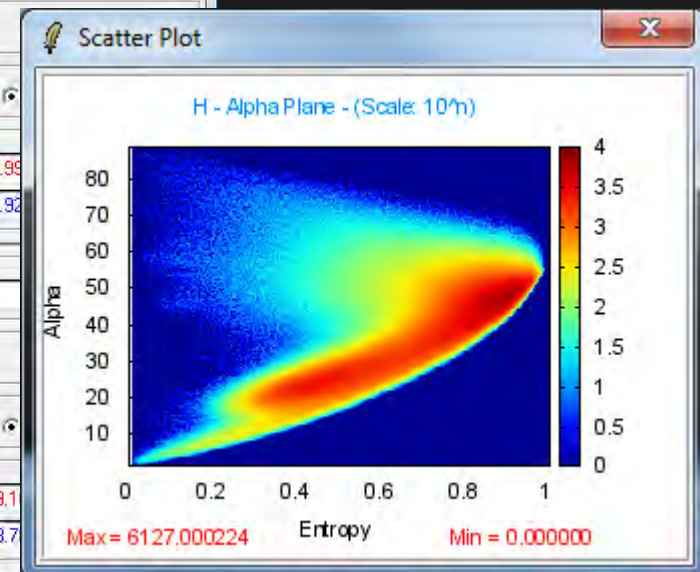
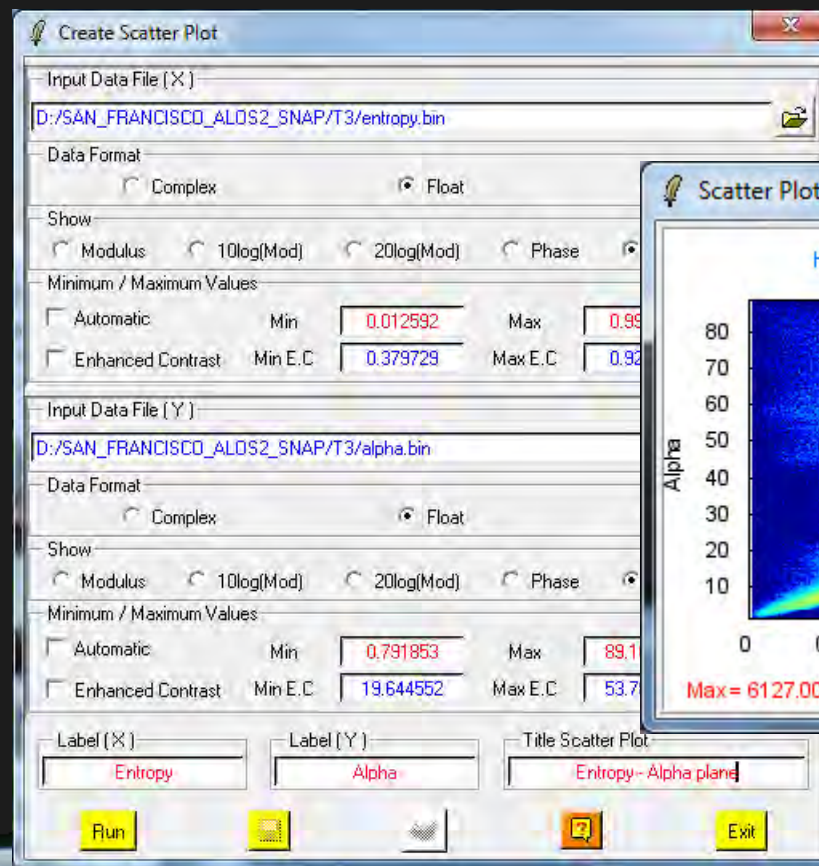
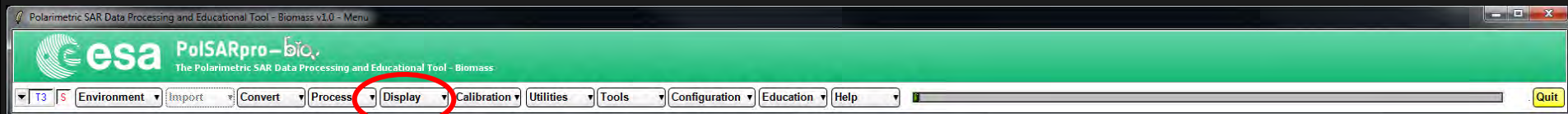
Create Pauli / Sinclair RGB Image



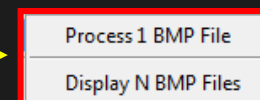
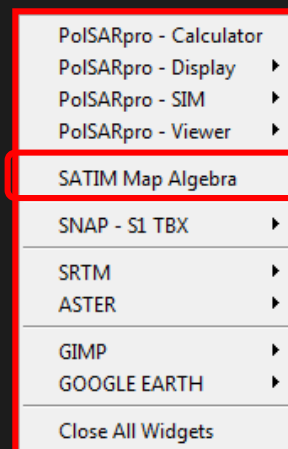
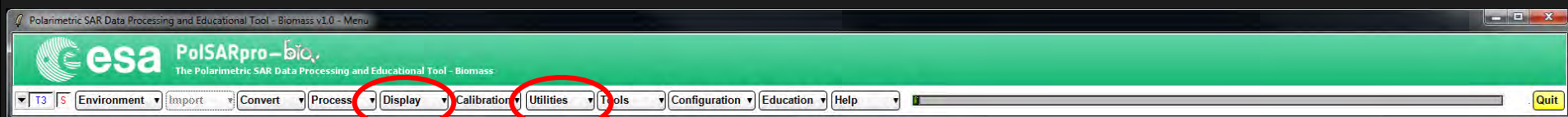
Create HSL Image



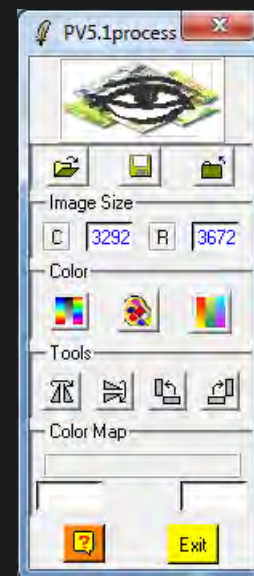
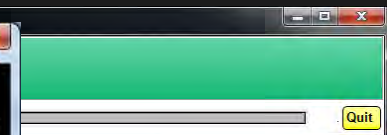
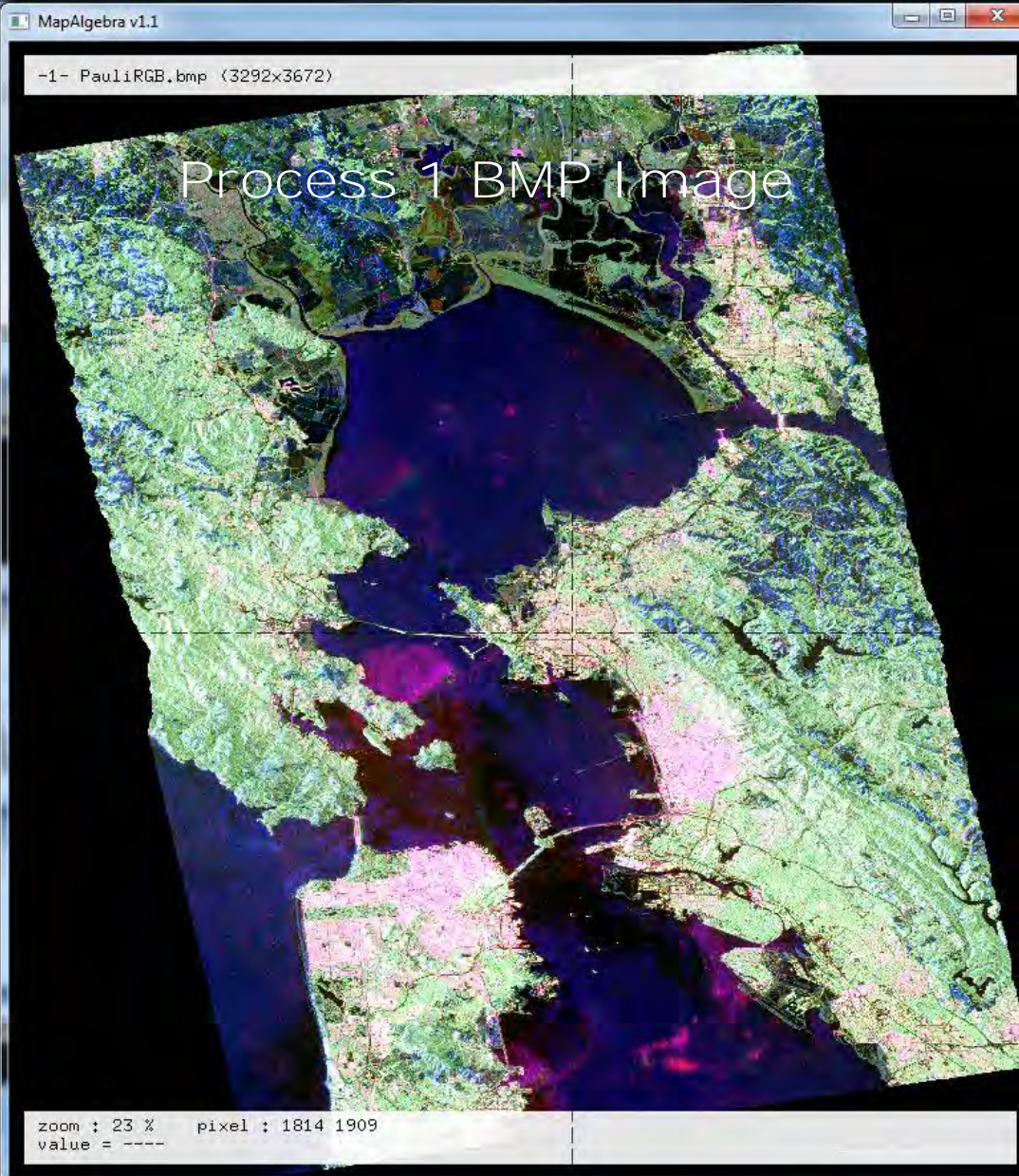
Create Scatter Plot

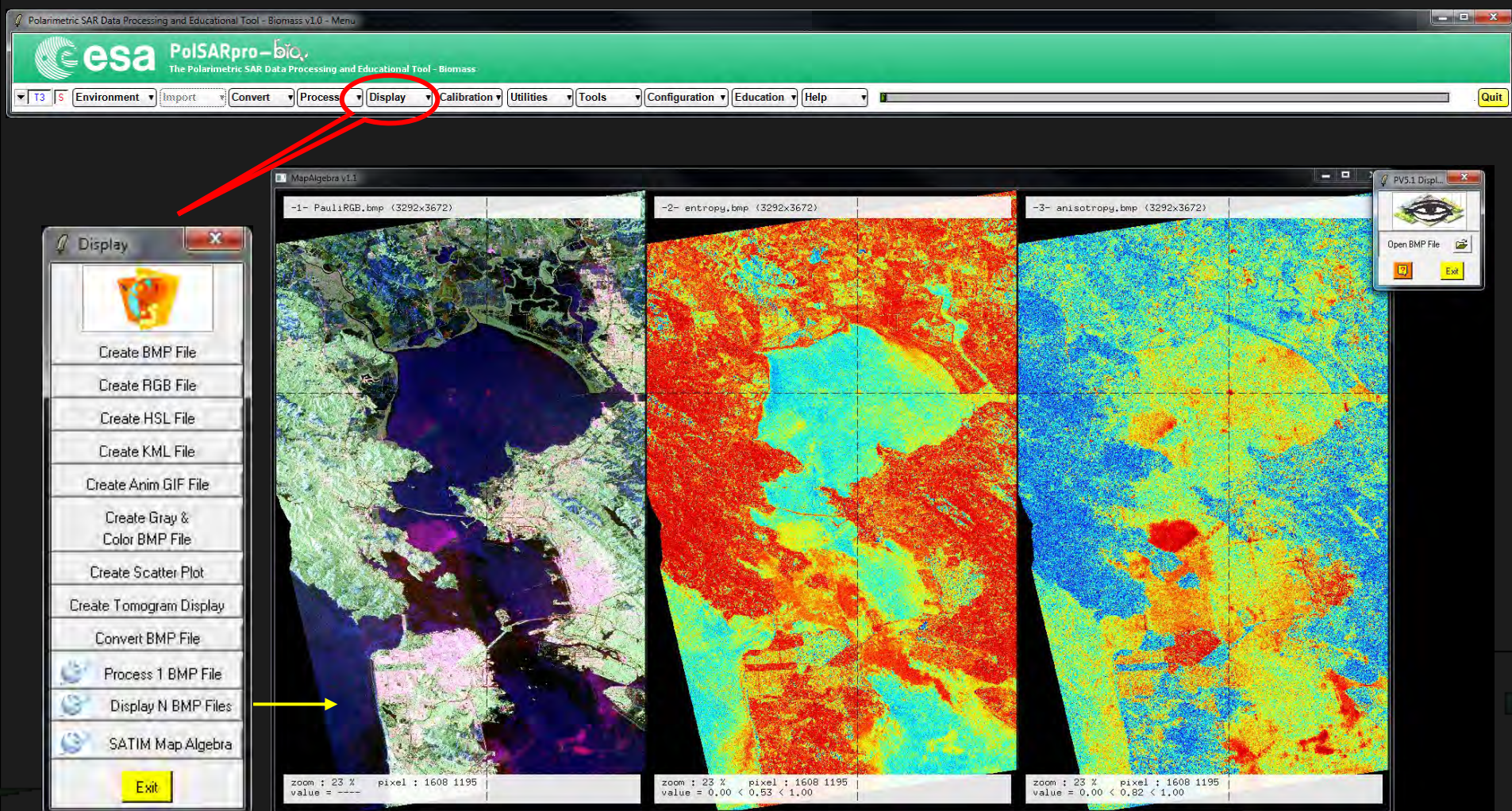


Create Scatter Plot



SATIM Map Algebra





Process N BMP Images



Questions ?

