

Processing Euro-SDR data set with MicMac

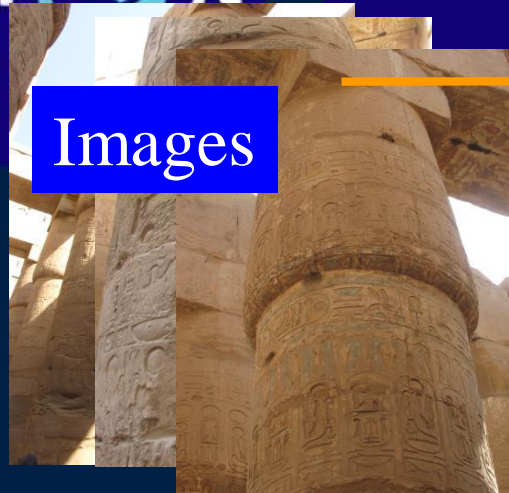
an open source software for
automatic orientation and calibration
of large set of images.

*Marc Pierrot Deseilligny,
Ecole Nationale des Sciences Géographiques
IGN*

IGN's open source pipeline

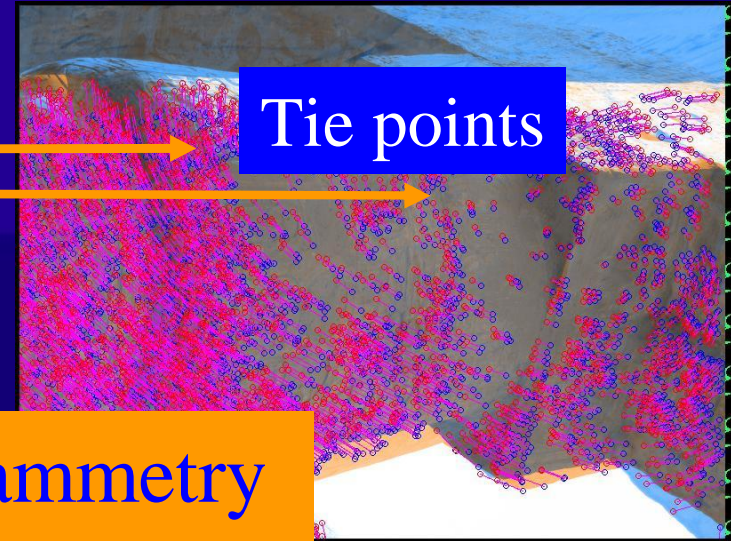


I



Images

Image processing
SIFT++
(D. Lowe, Vedaldi)



Tie points

Photogrammetry
computer vision
APERO
IGN, open source



3D model

Dense matching
Image processing
MICMAC
IGN, open source

Orientation, calibration

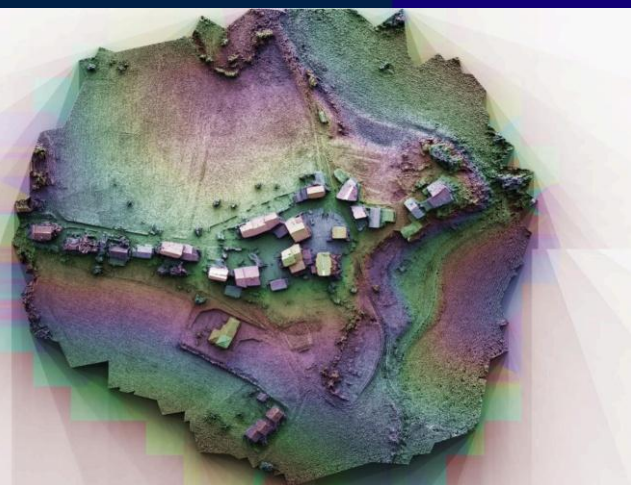
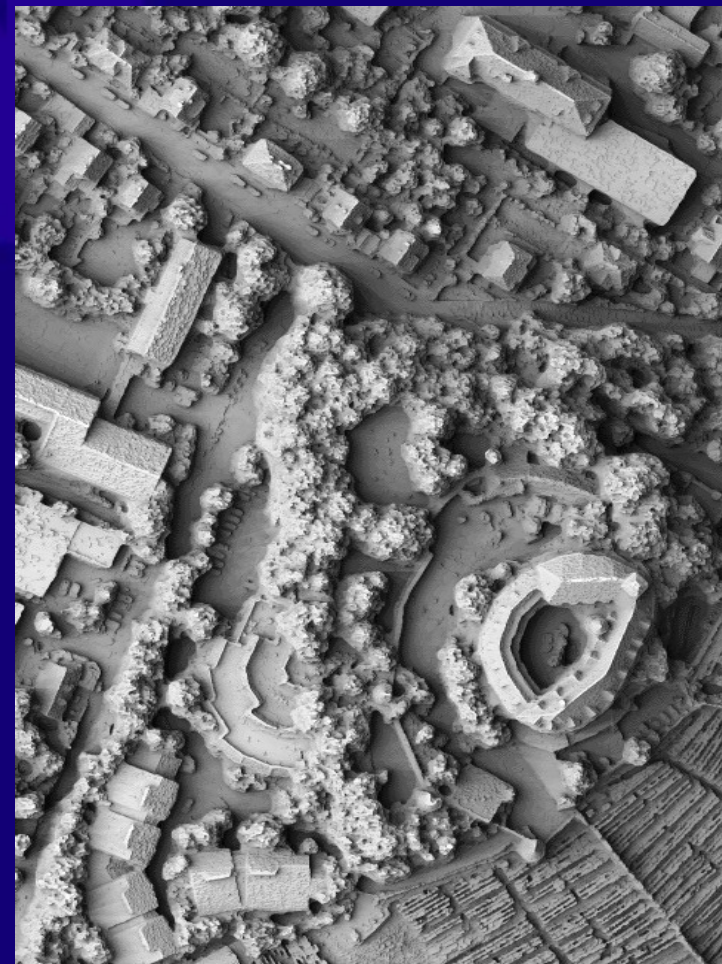
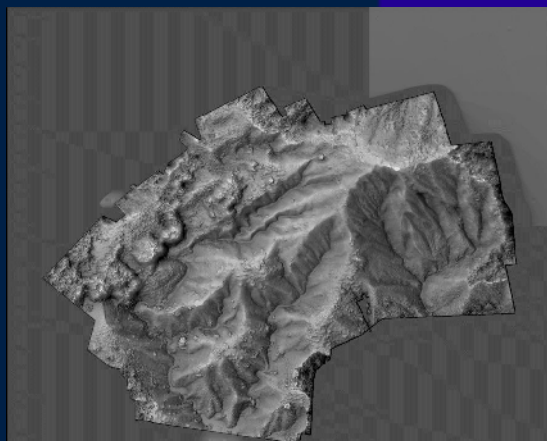


A general pipeline

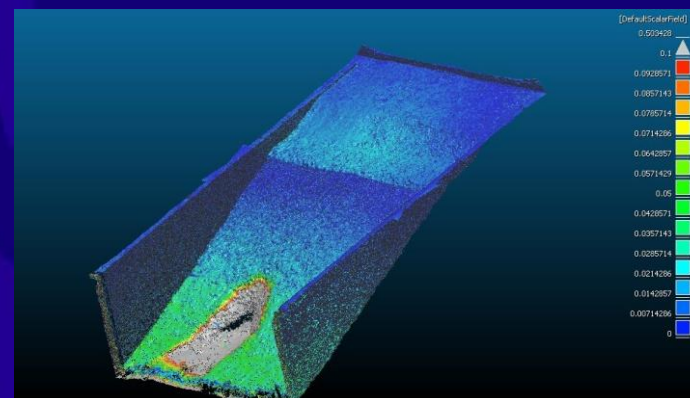
« Standard » aerial survey

UAV

Close Range



Industrial





Targeted user :

1- IGN for production (“internal hot line”)

2- Scientist for openness, ability to handle “large » data set (several 1000 image) and metrologic approach.

3- NMA/industry for test (free and documented)

Not targeted for people-*too complicated-* or industrial application-*no warantee-* (except in partnership).

Gnu-Linux, MacOs, Windows.

MicMac's main characteristic :

Multi resolution (coarse to fine)

Cross correlation similarity measure

Multi scale windows

Multi image matching

Energy minimization (graphe cut or home
variant on “dynamic programming/SGM »
approach)

Image geometry or ground geometry

Matching by pair of image : better for occlusion,
but slower than multi-image.

Matching in image geometry: better for occlusion
and ambiguity, but slower.

Test on a 8 core, 2.3Ghz lab top. No GPU.

Vaing ... : directly ground geometry multi image correlation. Computation 6h (3h if no multi-scale).

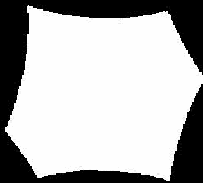
On Munich Data set (12h) :

1-Matching by selected pair (delaunay) of image
untill resolution 2.

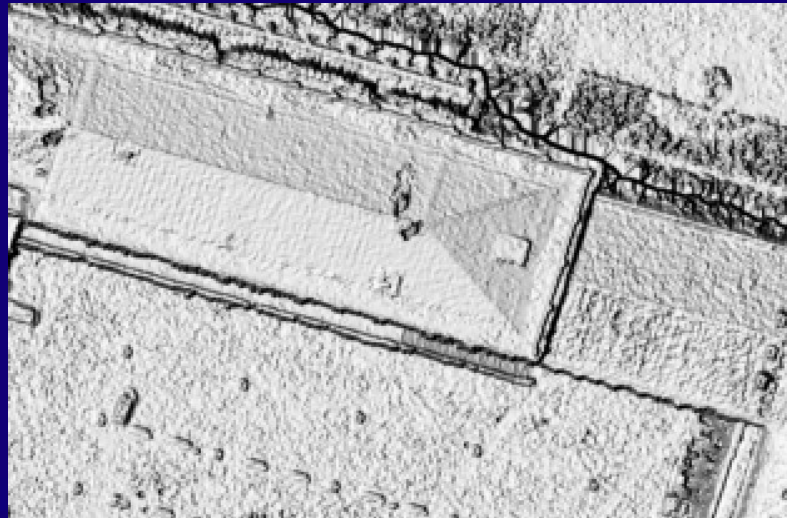
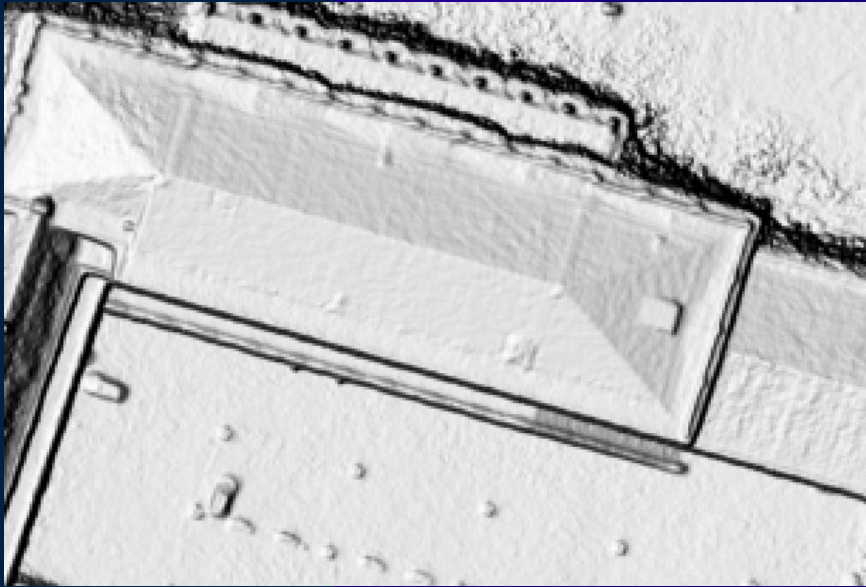
2-Fusion, matching in multi image at resolution 1 .

3-Projection in ground geometry and fusion.

For each « master image» do
the matching only on a subset
(mask of best nadir).

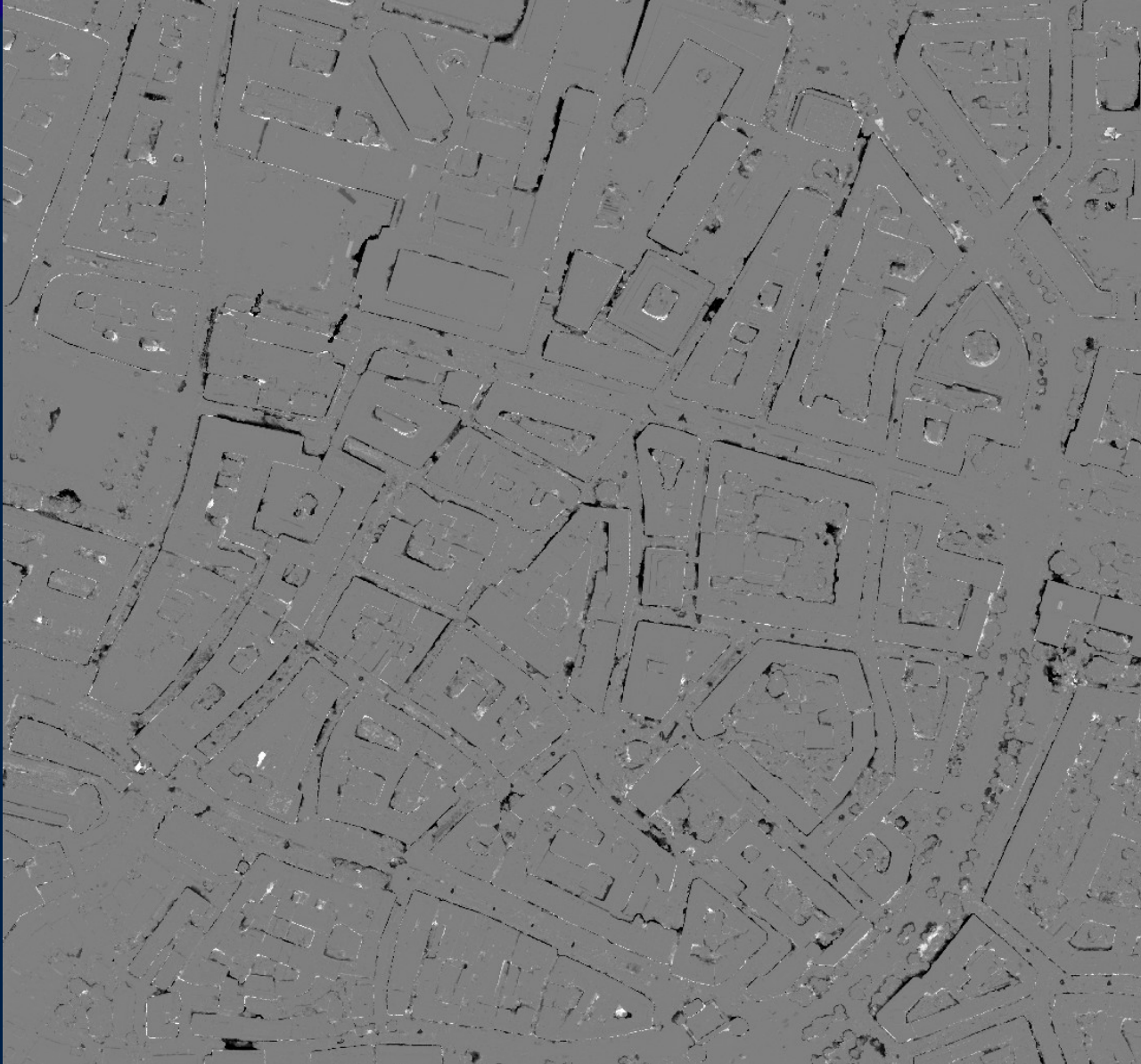


Comparison
with median DSM :

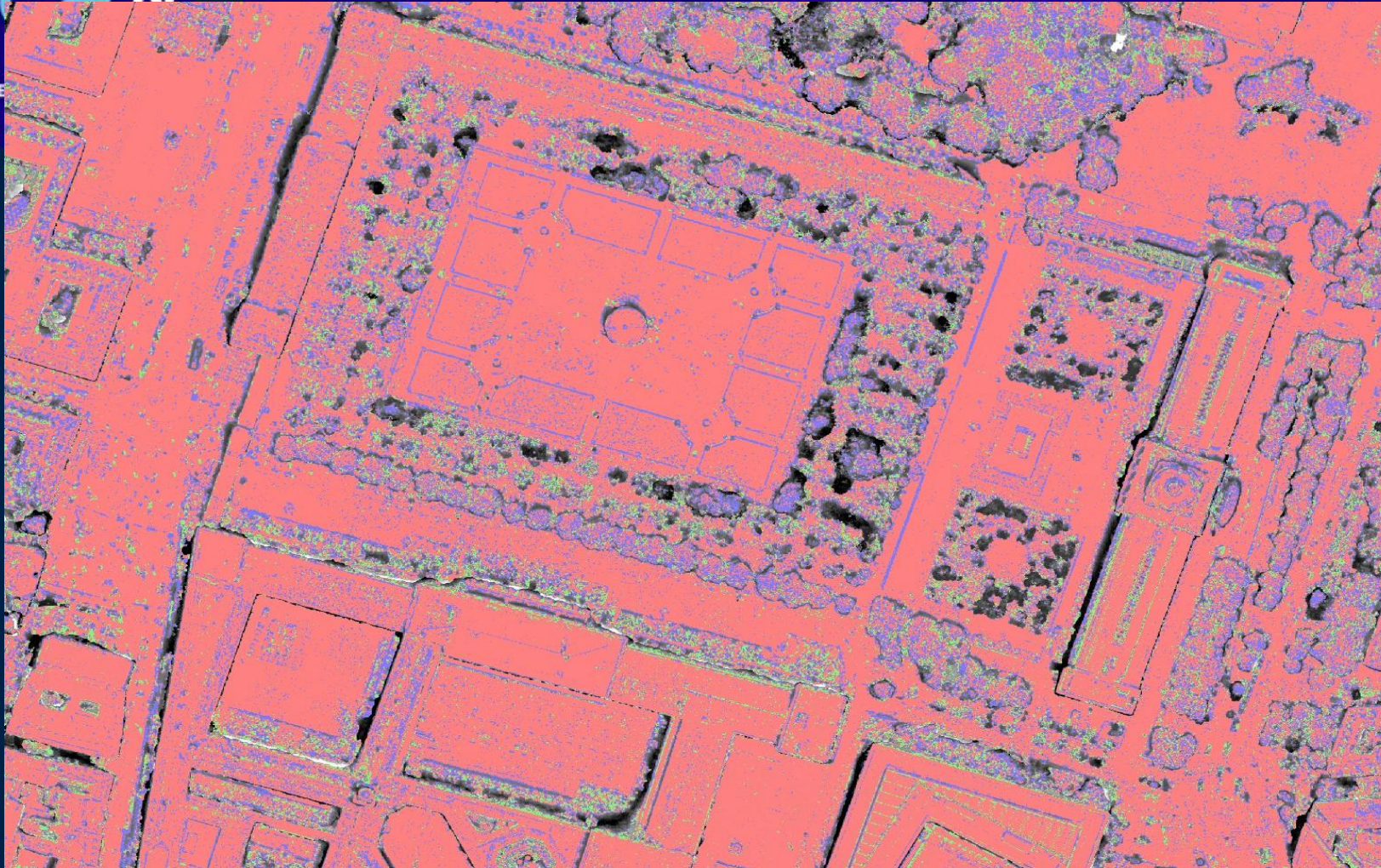
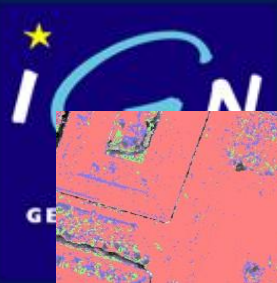


MicMac more noisy ;-(

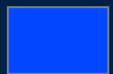
As expected difference are localized close to the discontinuity.



Qualitative analysis.



Differences are < 15 cm

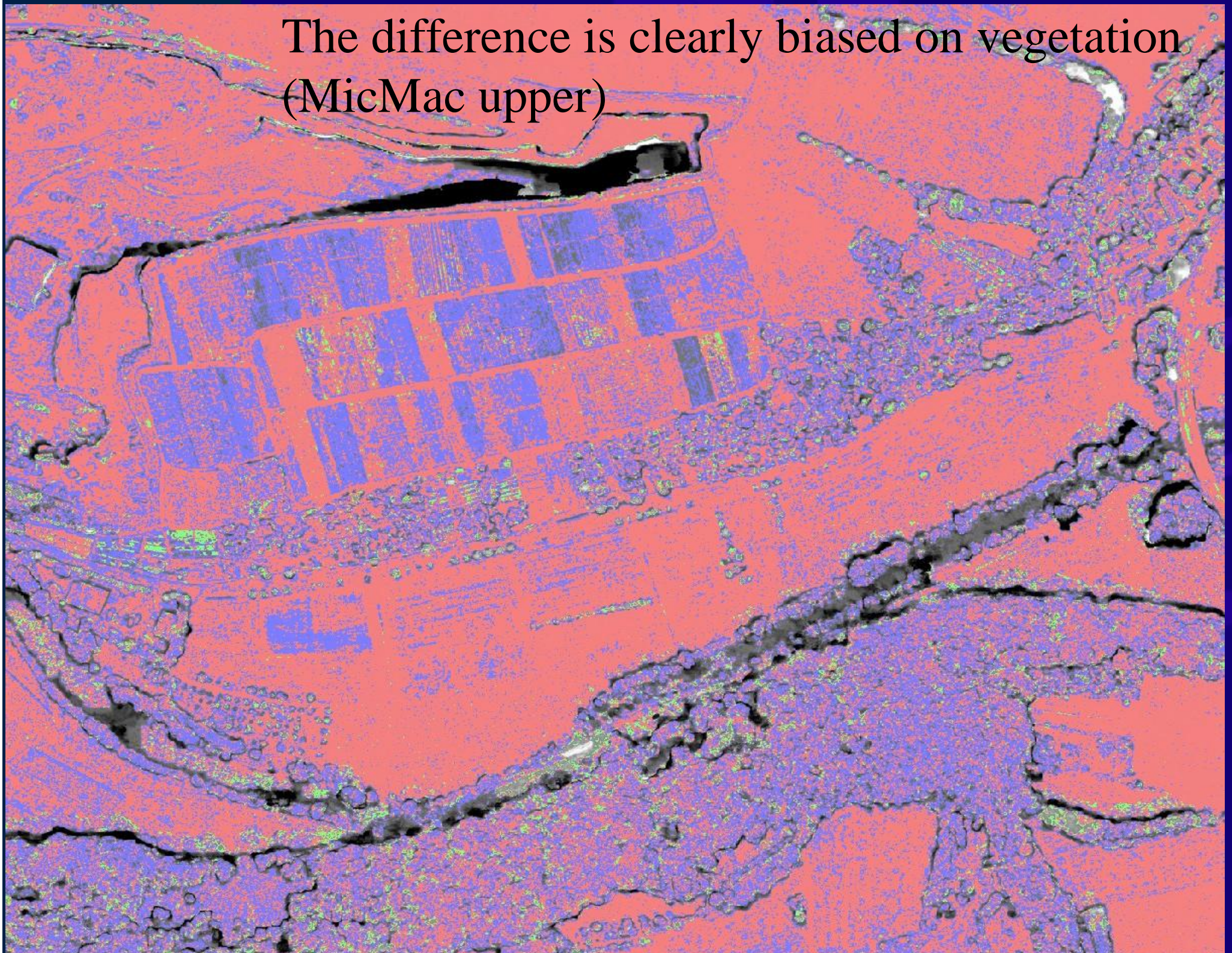


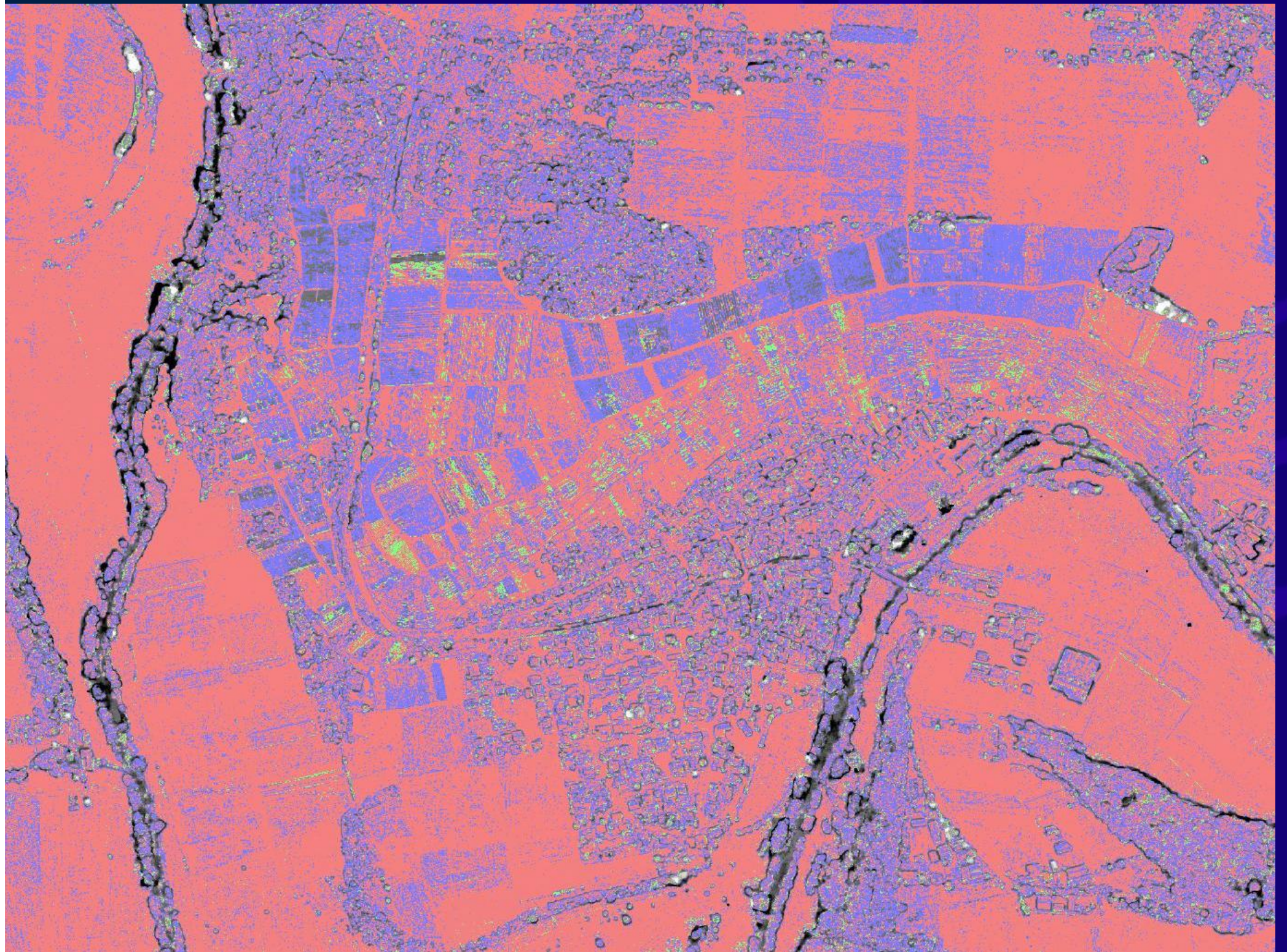
MicMac is upper (< 1 m).



MicMac is lower (< 1 m).

The difference is clearly biased on vegetation
(MicMac upper)







Download software:

“IGN logiciels” (on yahoo, google, bing...)

“Forum MicMac” ...

Summer school photogrammetry for forestry:
software provider (19-23 August): contact me
if interested to present your software.

For patnership in R&D with MicMac,
contact me.