COLOCVIUL INTERNAȚIONAL BRÂNCUȘI

ANSAMBLUL MONUMENTAL BRÂNCUȘI 80 ANI

TÂRGU JIU

24 - 28 OCTOMBRIE 2018

Viata monumnetului si viata orasului
The Monument Life and Town Life

Roxana Radvan, Laurentiu Angheluta, Alexandru Chelmus, Lucian Ratoiu
National Institute for Research & Development in Optoelectronics - INOE 2000
Centre for Restoration with Optoelectronic Techniques - CERTO
Magurele - Romania

ICOMOS Romania

ASRO

COLOCVIUL INTERNAȚIONAL BRÂNCUȘI

ANSAMBLUL MONUMENTAL BRÂNCUȘI 80 ANI

TÂRGU JIU

24 - 28 OCTOMBRIE 2018

Constantin Brancusi

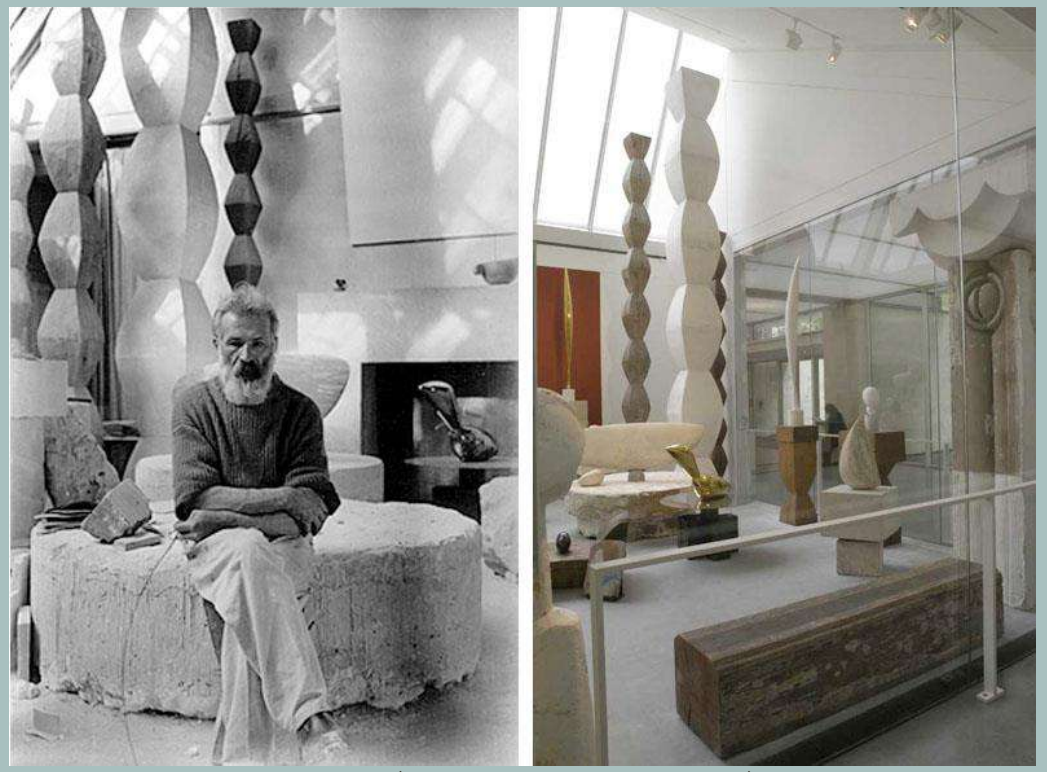
Monumental Ensemble from Targu Jiu

Multiannual Monitoring Program

Perspectives

“Work like a slave; command like a king; create like a god.”

https://www.guggenheim.org/artwork/artist/constantin-brancusi



Constantin Brancusi (born 1876, Romania) studied at the *Scoala Natzionala de Arte Frumoase*. Eager to continue his education in Paris, Brancusi arrived there in 1904 and enrolled in the Ecole des Beaux-Arts in 1905.
The following year, his sculpture was shown at the Salon d’Automne, where he met Auguste Rodin.

Amazing studios of the Romanian sculptor, which have been recreated by architect Renzo Piano and installed, as a wonderful free museum, to the Centre George Pompidou.

“ At the shadow of great oaks nothing superior can grow”

The *Monumental Ensemble* from Targu Jiu

- Was commissioned by the *National League of Gorj Women* to honor those soldiers who had defended in 1916 from the forces of the Central Powers.

- Constantin Brâncuși (1876–1957) was at the time living in Paris, but welcomed the opportunity to create a large commemorative sculpture in his homeland.

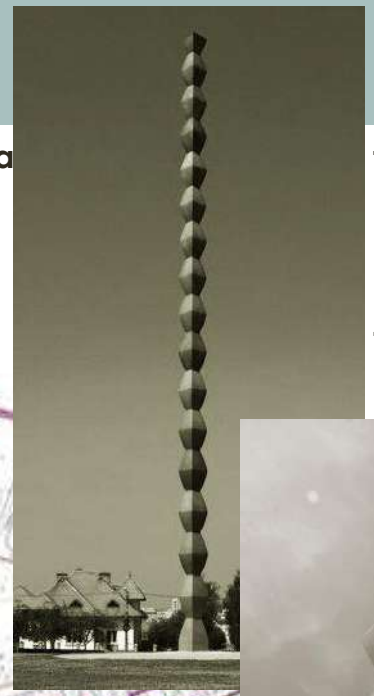
- He accepted the commission in 1935.

- The *Ensemble* spreads over 1200 m and has been inaugurated on 27 October 1938.

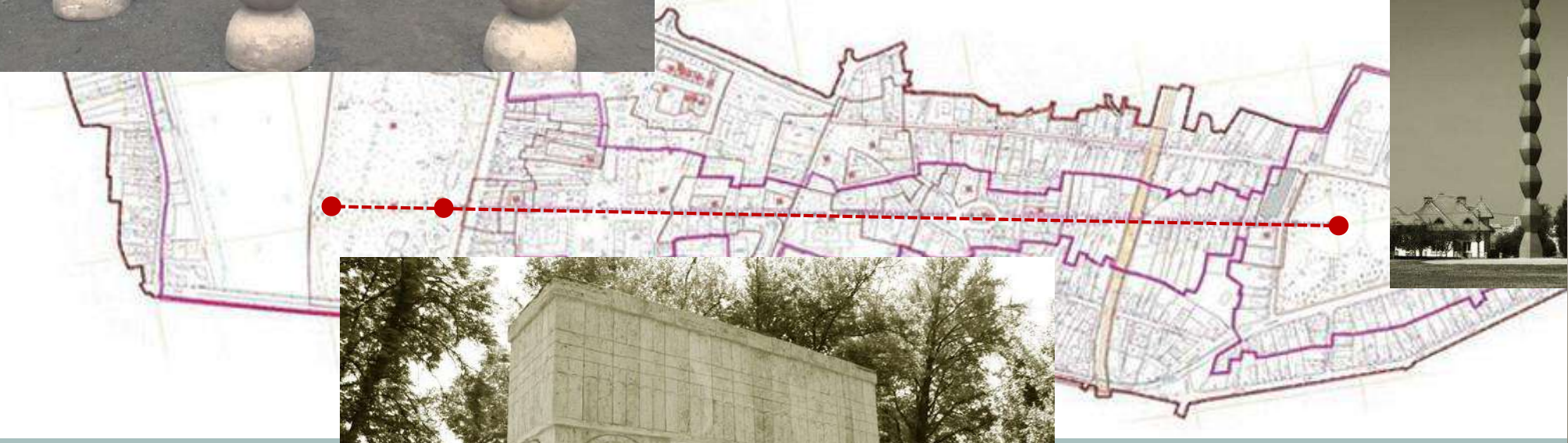
Circular stone table surrounded by twelve hourglass-seats, which symbolize time.
The *Table* represents the moment before the battle on which the combatants were going to participate. Nevertheless, the seats are not located close to the edges of the table.

Monumenta

the Heroes"



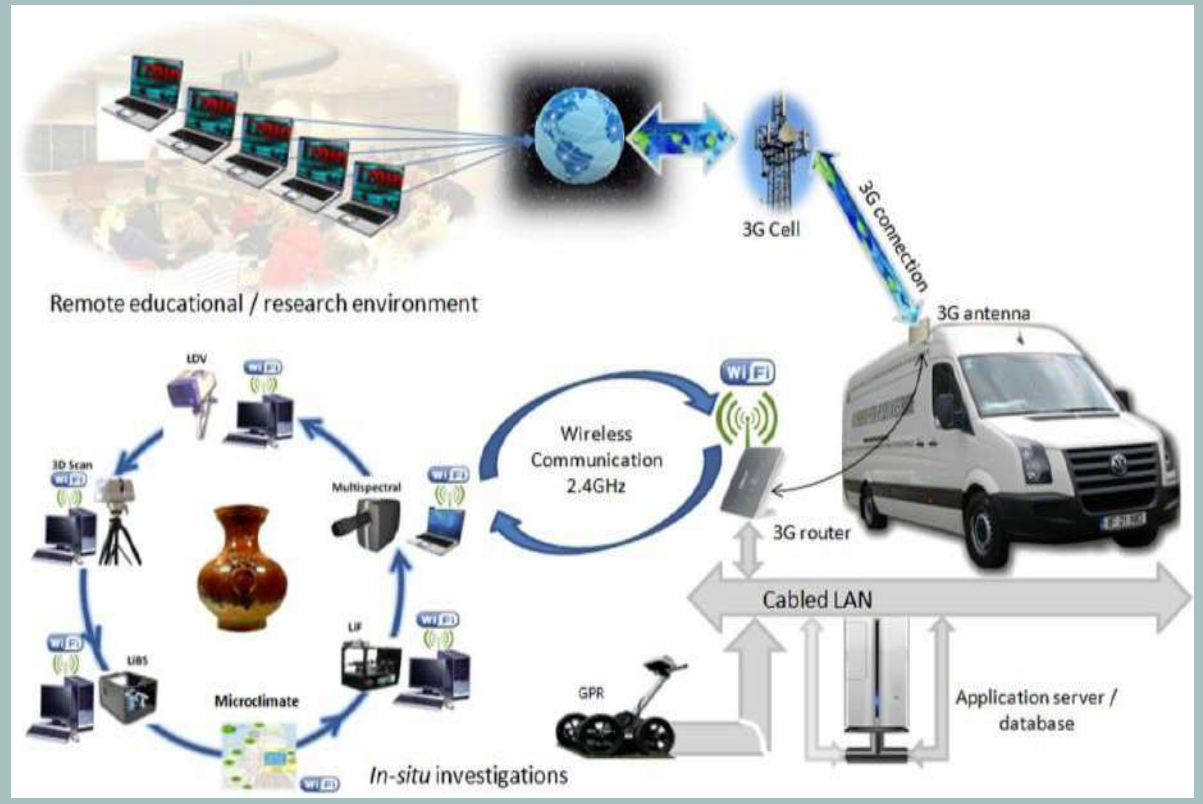
THE ENDLESS COLUMN



The Gate of the Kiss, of Banpotoc travertine (marble), features a kiss motif on the gate pillars.
The transition to another life occurs through the Gate of Kiss.

The Endless Column symbolizes the concept of Infinity
It is considered by Sydnei Geist the top point of the modern art.
The *Infinity Column* stacks 17 rhomboidal modules, with a half-unit at the top (total height of 29.3 m).
The incomplete top unit is thought to be the element that expresses the concept of the infinite.

Multiannual Monitoring Program 2015-2019



Elaboration and validation of a complex protocol

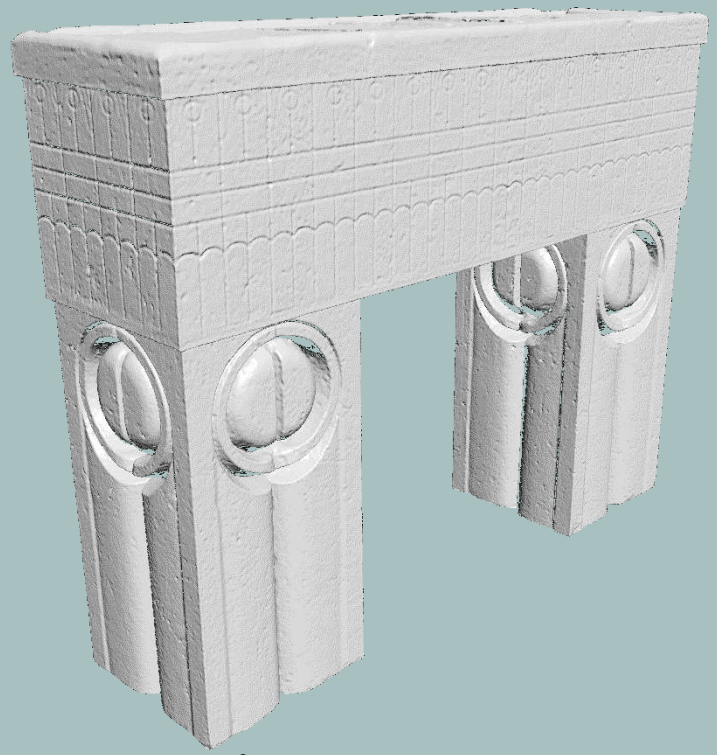
ART4ART Mobile Laboratory
Advantages:
Non-contact
Non-Invasive (Micro-invasive)
Fast Response (generating richer and more relevant archive on interventions history and events)

Correlative data collection
- Oriented interrogation protocol on selected points network
- Aggressive factors impact evaluation
- Vulnerabilities' monitoring
- Proper Restoration program elaboration
- Prediction/Risk factors distributions/Decay rate
- Simulation of the intervention

Infrastructure:
LIFS, LIBS, GPR –Mala, 3D Surphaser, UAV – ITALDRON, Hiperspectral SWIR 384, LIDAR Yellow Scan, Mulispectral ARTIST Camera/ , XRF – Tracer III Bruker, Thermacamera
FTIR –Perkin Elmer, Leica –portable microscope, portable colorimetry,

Multiannual Monitoring Program 2015-2019

- Environmenal Stress Factors 1
- 3D Digital Models 2
- Body/ Volume 3
- Physico-Chemical Investigations 4

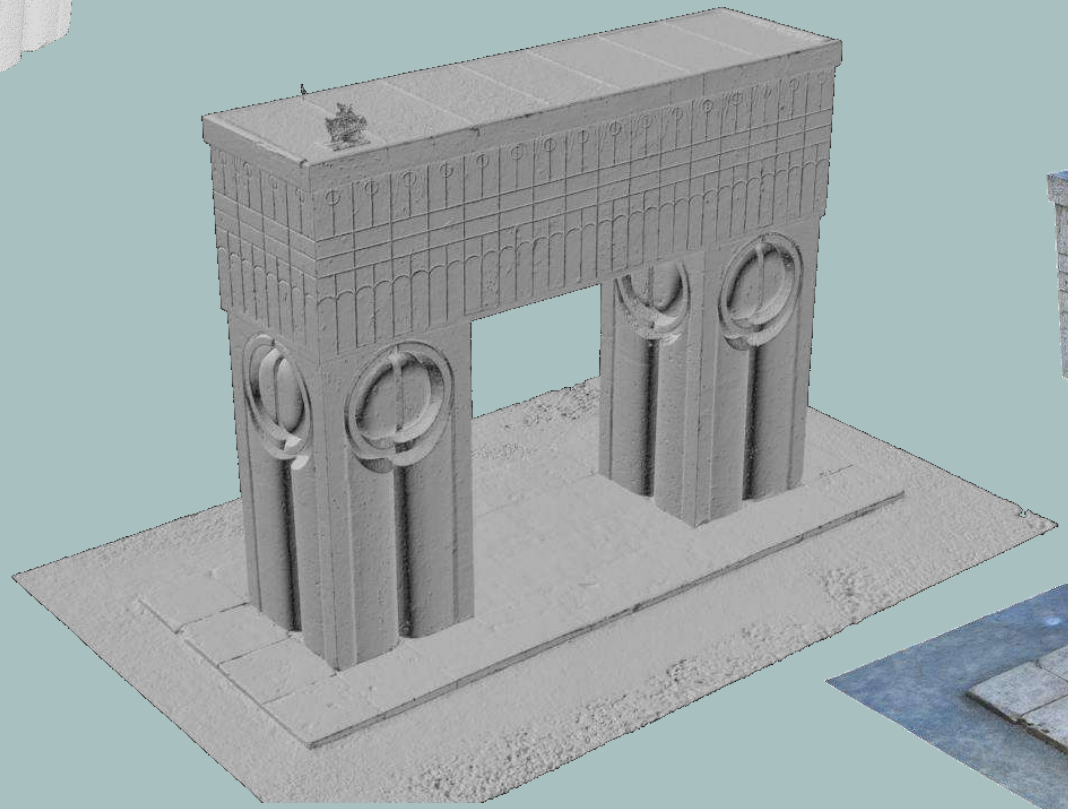


3D laser scanning

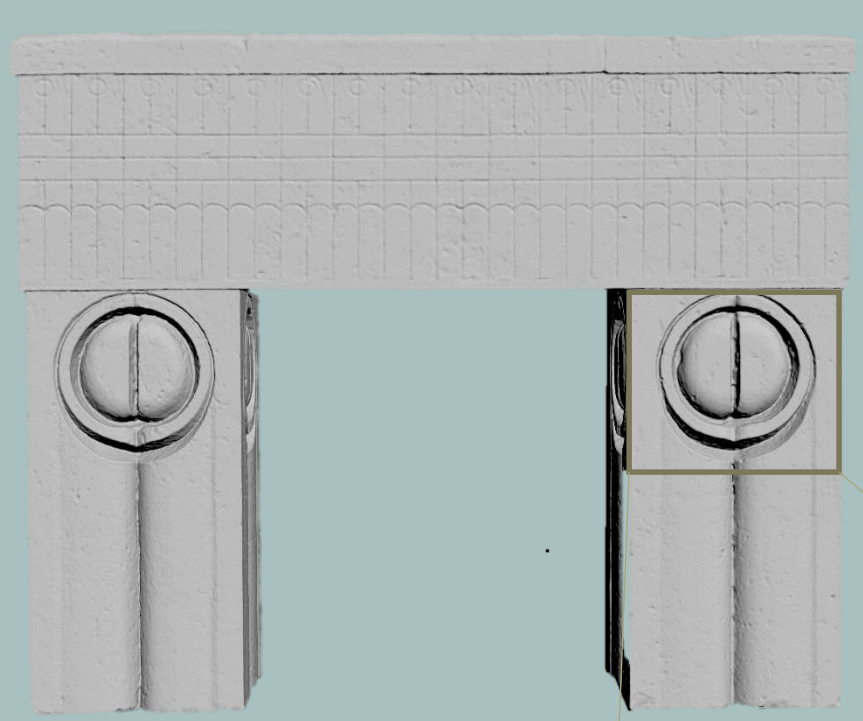
56 scanning positions
scanare
Surphaser HS25
47 GB data 3
days for data aquisitions
~40 h processing

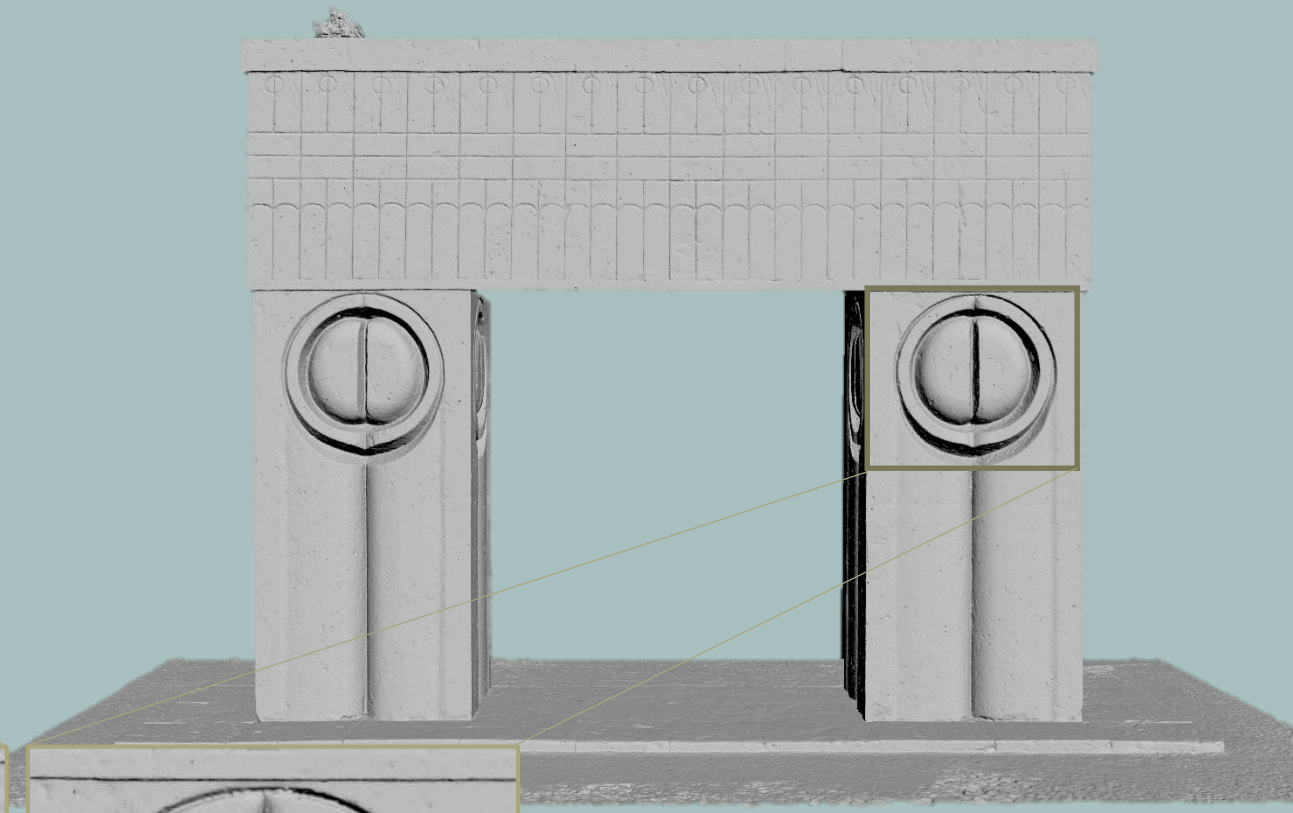
Photogrammetry

894 images
Nikon D810
5520x3680px
8,5 GB date neprocesate
1h30m data acquisition time
~76h processing
522 millions polygons
10 millions



Western Facade

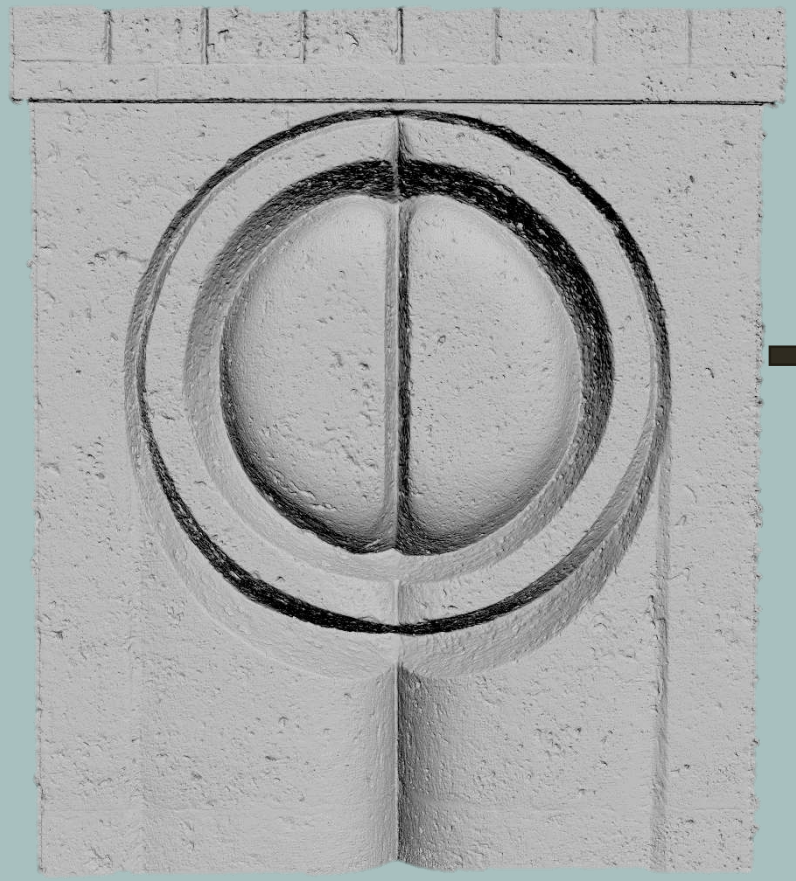




3D laser scanning
6.195.000 polygons

Photogrametry
6.000.000 polygons

Mesh 3D

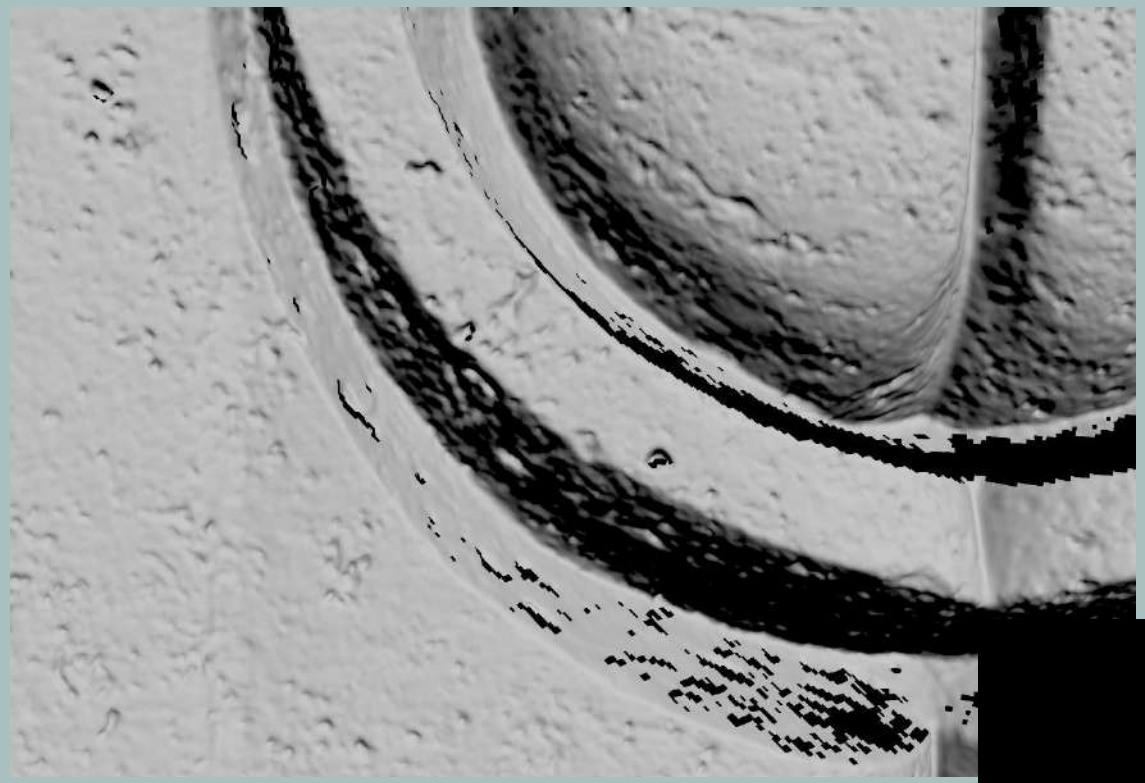


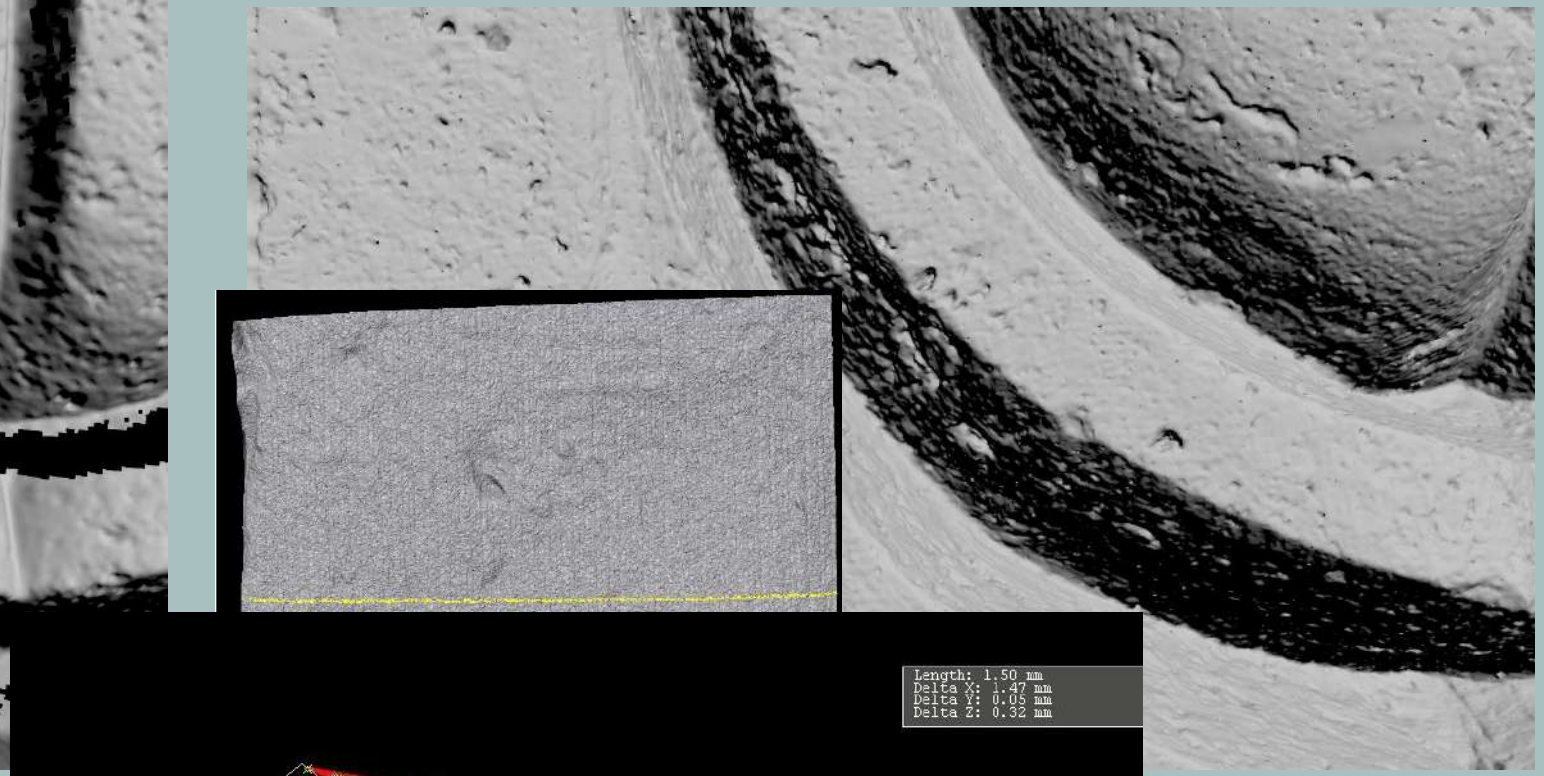
Mesh 3D

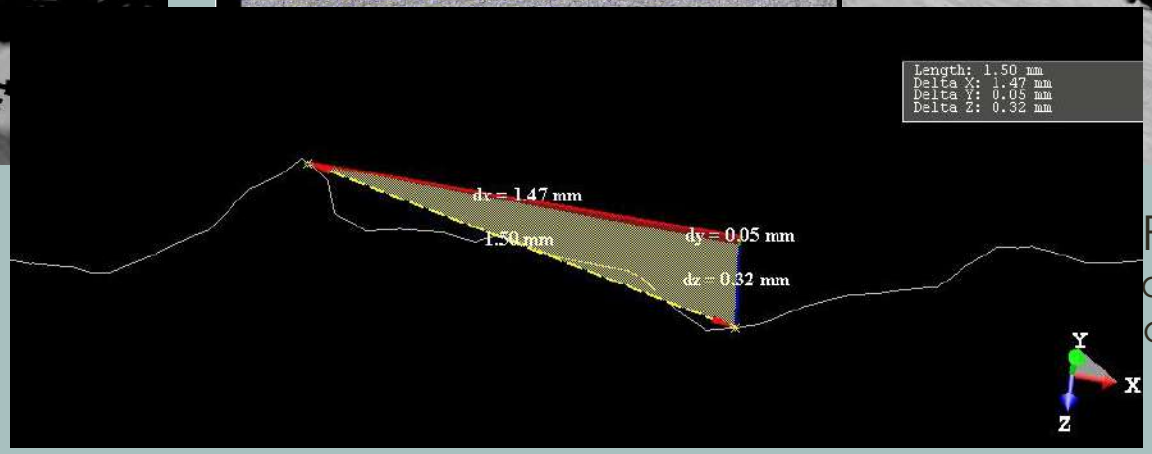
Texture

3D laser scanning
793.000 polygons

Photogrammetry
~400.000.000 processed polygons
10.000.000 displaied polygons







3D laser scanning

Dark areas represent gaps of related information

~**9 mm** resolution in average model

Photogrammetry

of related information

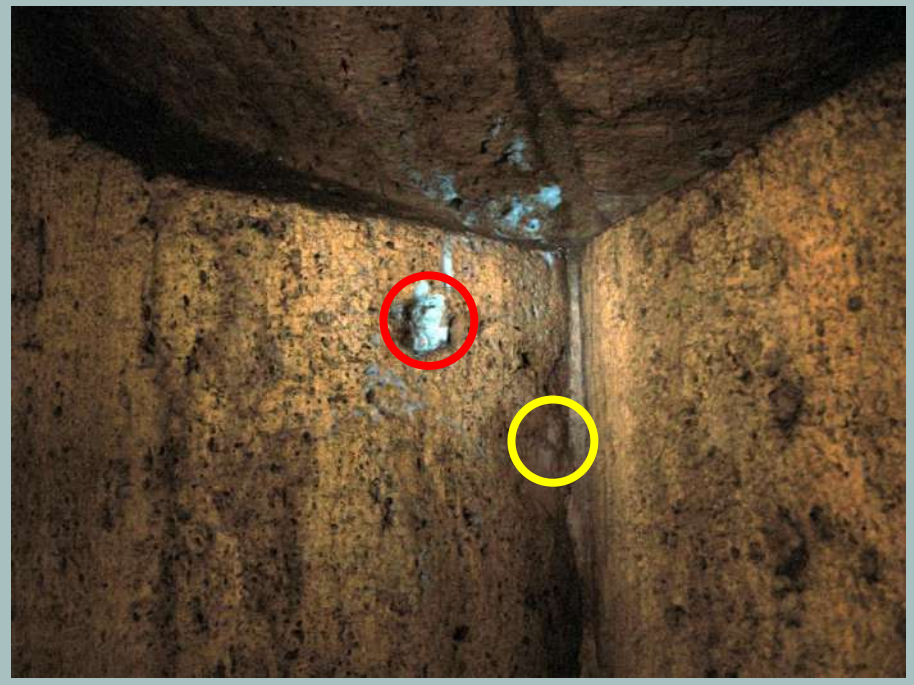
on in average model

2015

2016

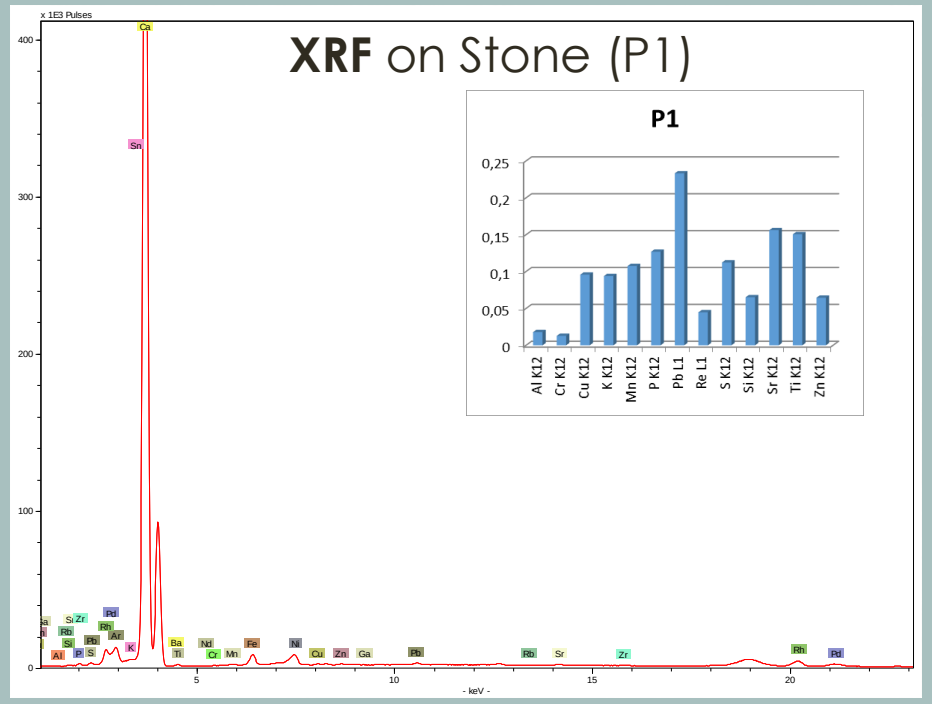
2015

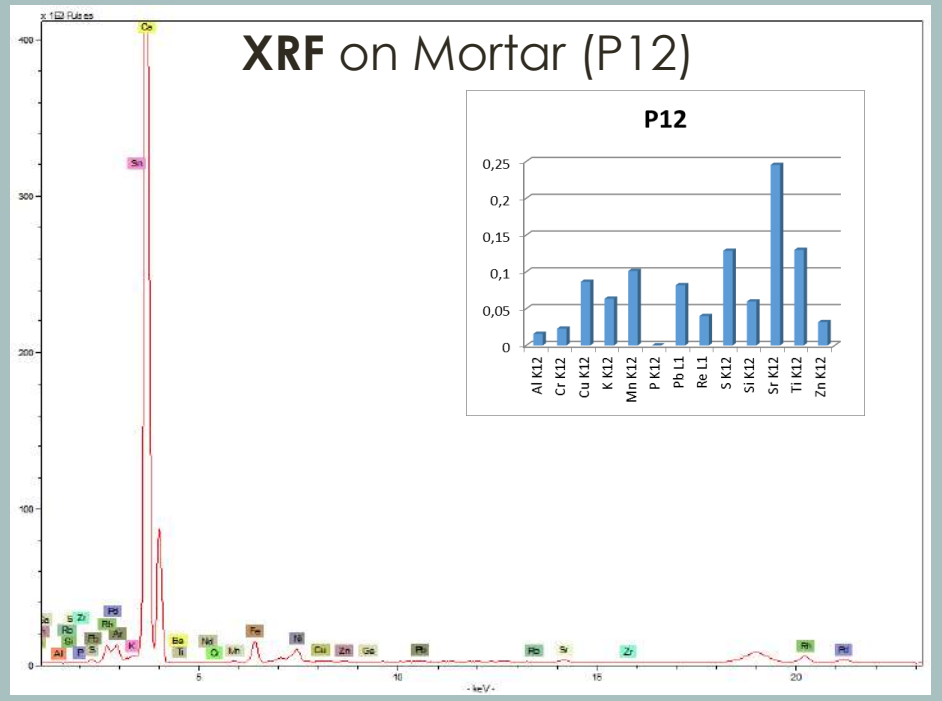

alveoli clogged with
natural banded calcite
fine lime mortar



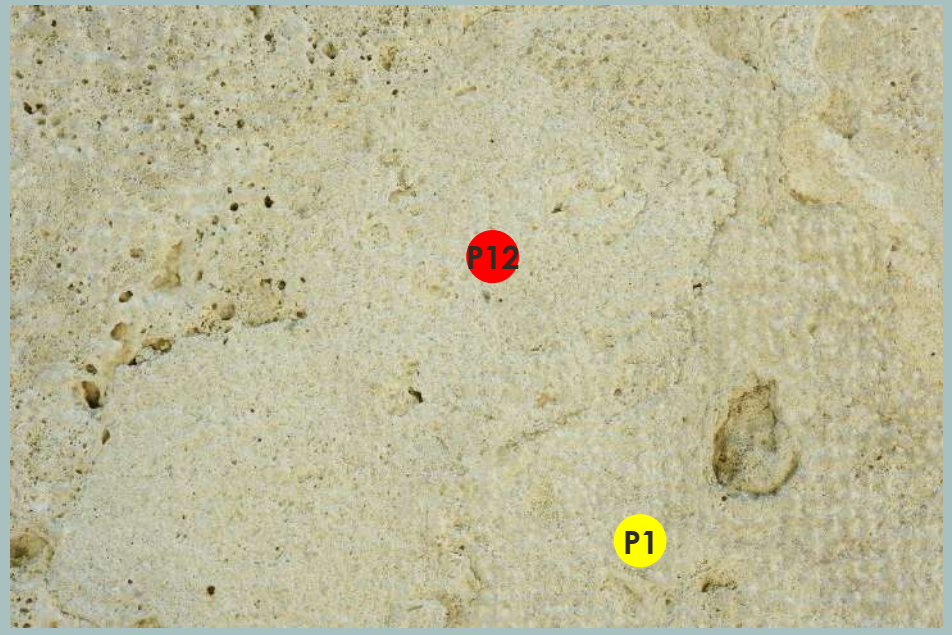
2016

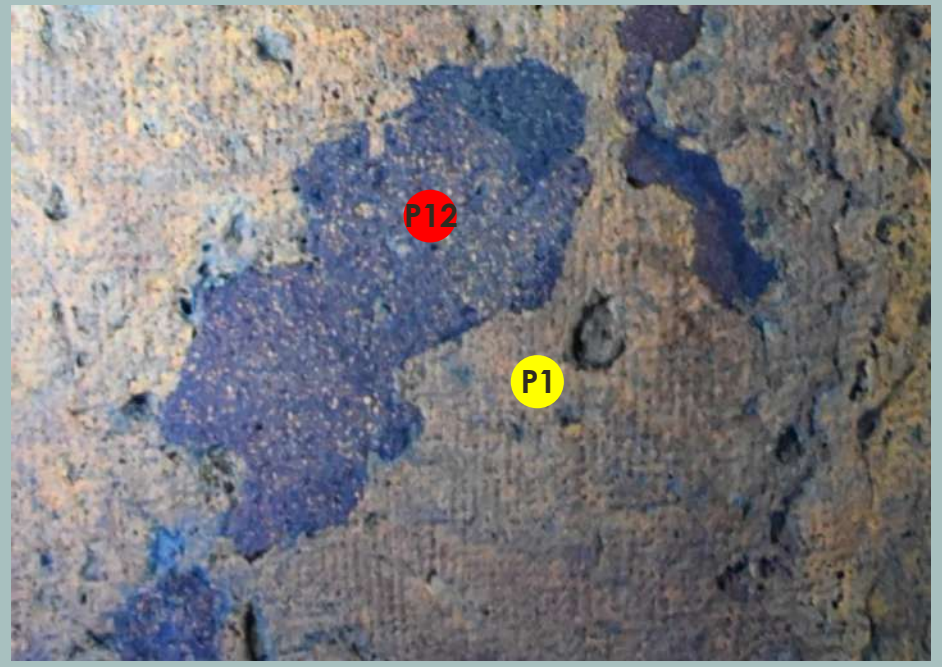
2015


XRF on Stone (P1)
P1
0,25
0,2
0,15
0,1
0,05
0
Al K12
Cr K12
Cu K12
K K12
Mn K12
P K12
Pb L1
Re L1
S K12
Si K12
Sr K12
Ti K12
Zn K12
- keV -


XRF on Mortar (P12)
P12
0,25
0,2
0,15
0,1
0,05
0
Al K12
Cr K12
Cu K12
K K12
Mn K12
P K12
Pb L1
Re L1
S K12
Si K12
Sr K12
Ti K12
Zn K12
- keV -

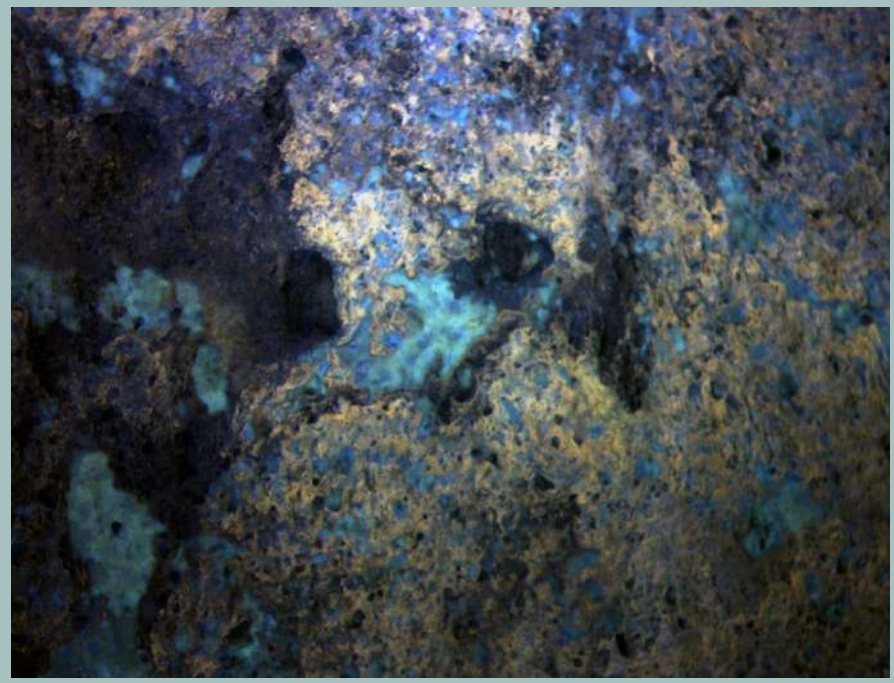
2016


P12
P1

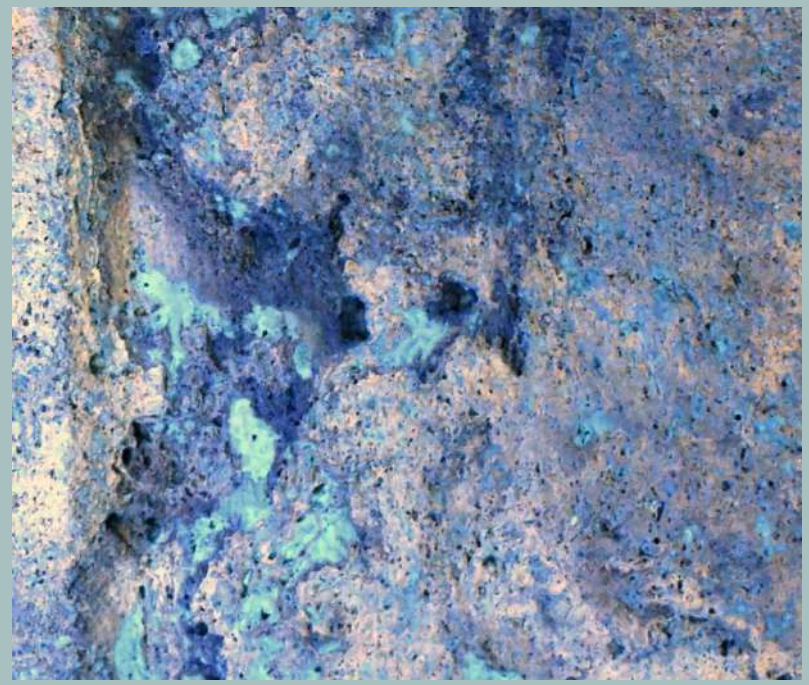

P12
P1

N 1

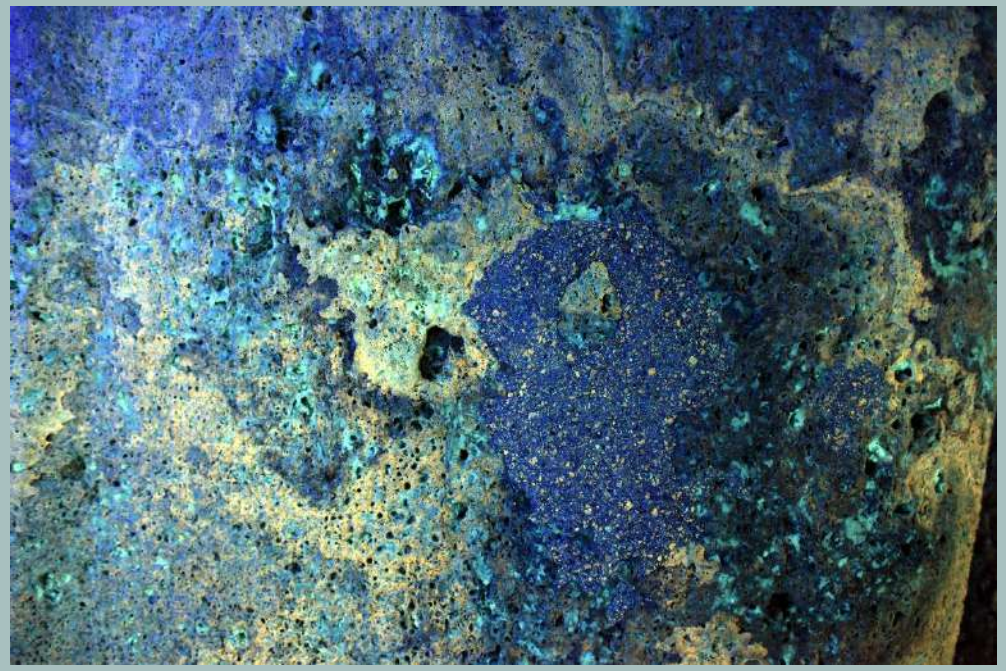
2015

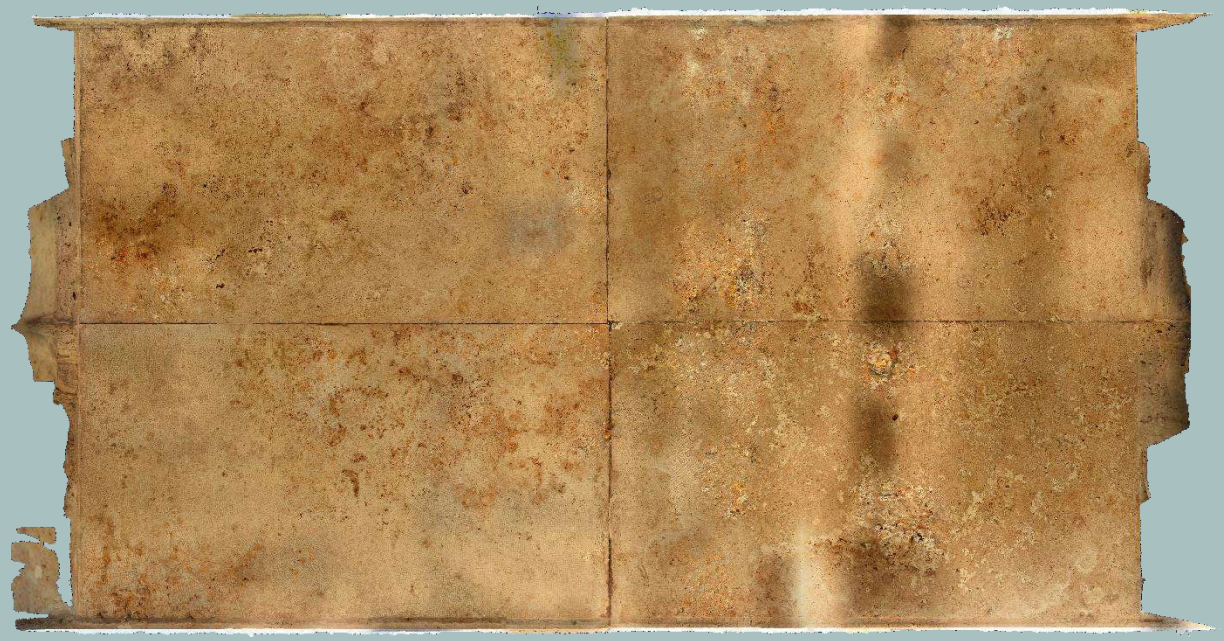


2016



2016

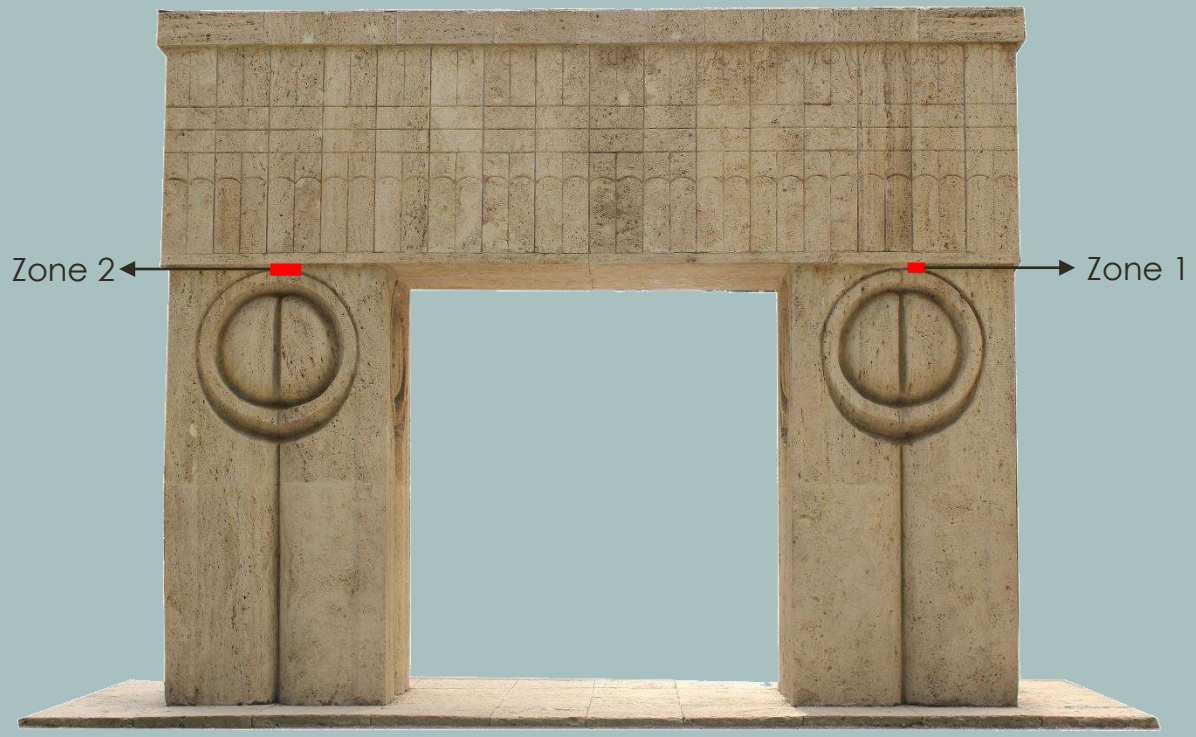




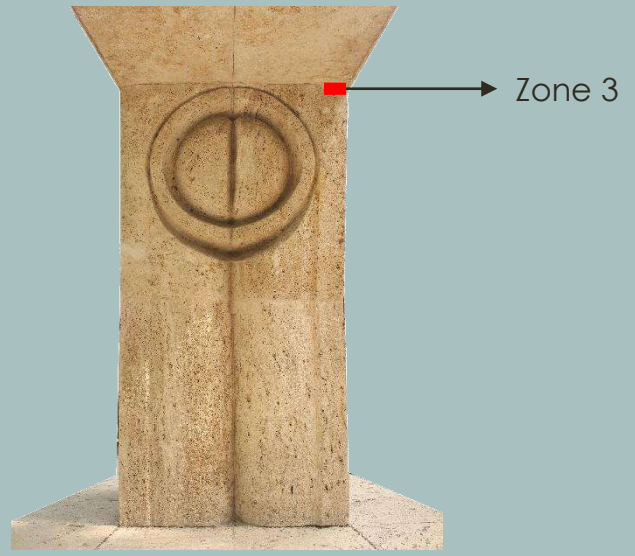
sublintou

Critical zones on investigated areas

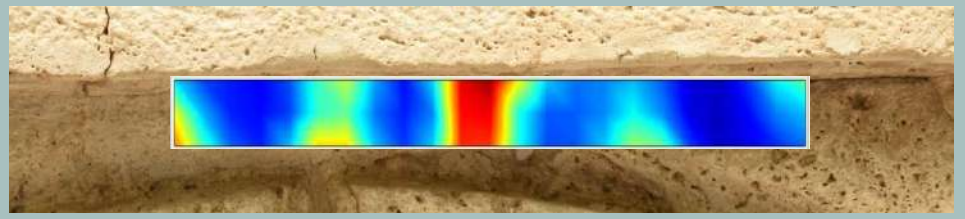
West Facade



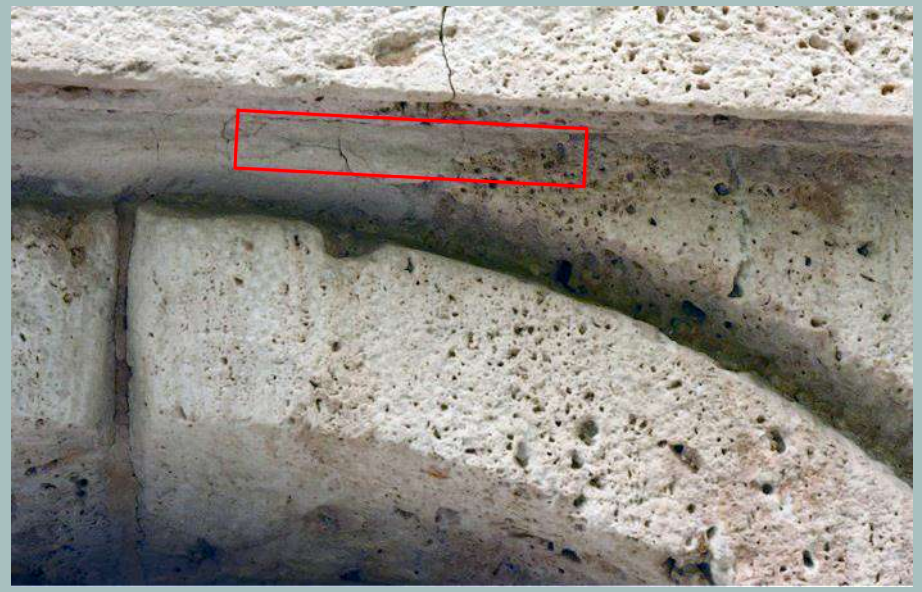
North Column
Interior facade



VN 2



VS 2



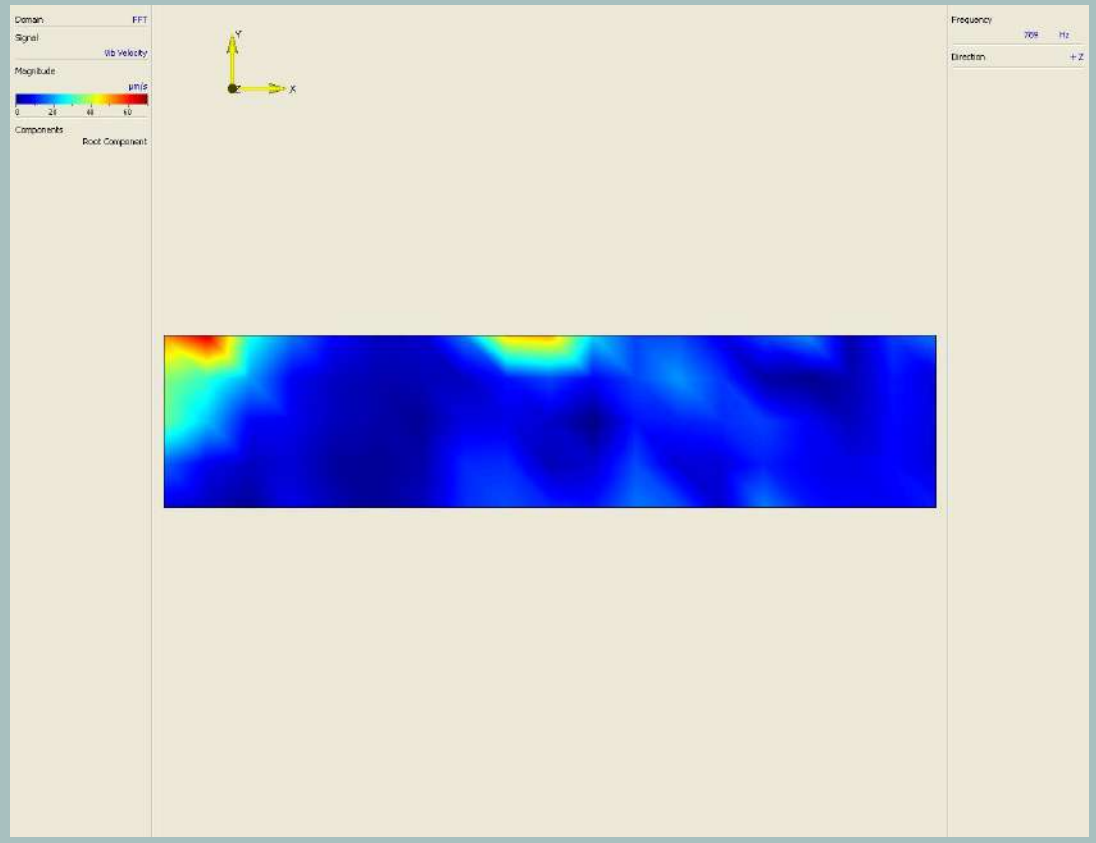
Zone 1/2015:

Scanning points: 95

Burst Chirp 5 V

Function generator

Type: NI 671x
Signal: Burst Chirp
Amplitude: 5 V
Offset: 0 V
Start frequency: 100 Hz
End frequency: 700 Hz
Burst start: 50 %
Burst length: 90 %
Multiple Channels: Off



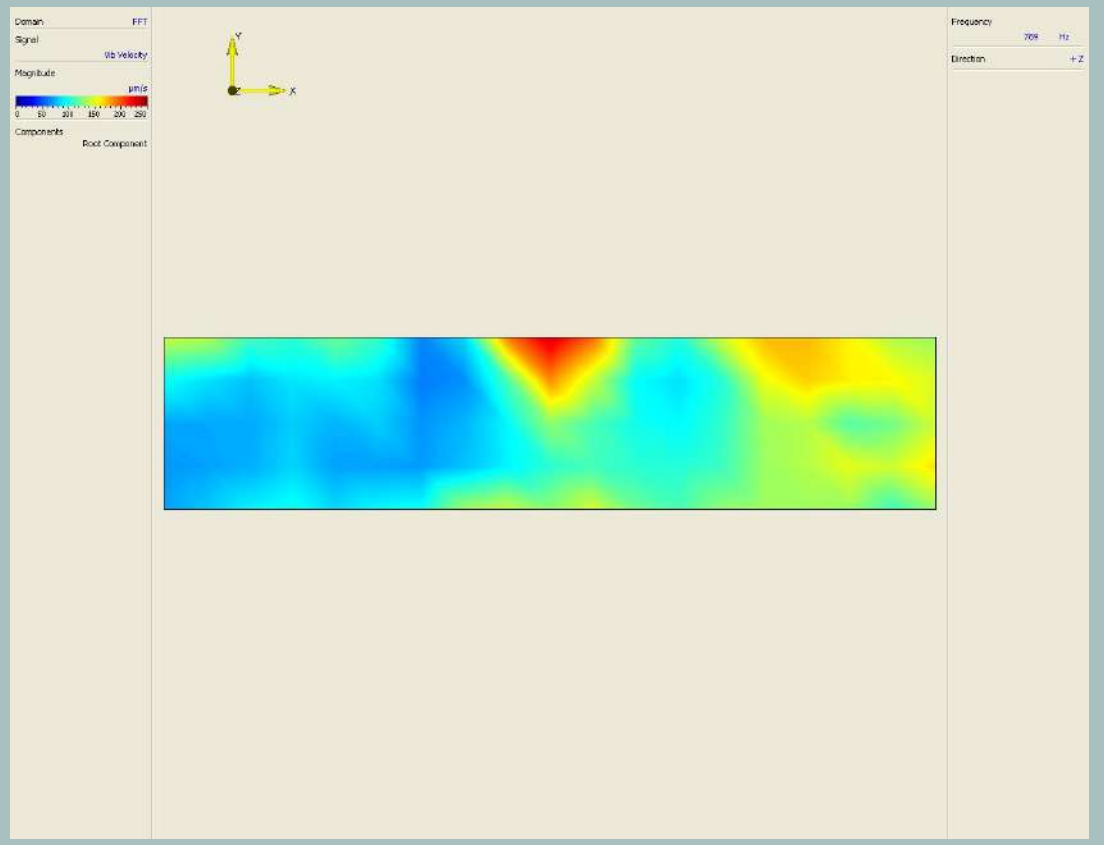
Zone 1:

Scanning points: 95

Burst Chirp 10 V

Function generator

Type: NI 671x
Signal: Burst Chirp
Amplitude: 10 V
Offset: 0 V
Start frequency: 100 Hz
End frequency: 700 Hz
Burst start: 50 %
Burst length: 90 %
Multiple Channels: Off



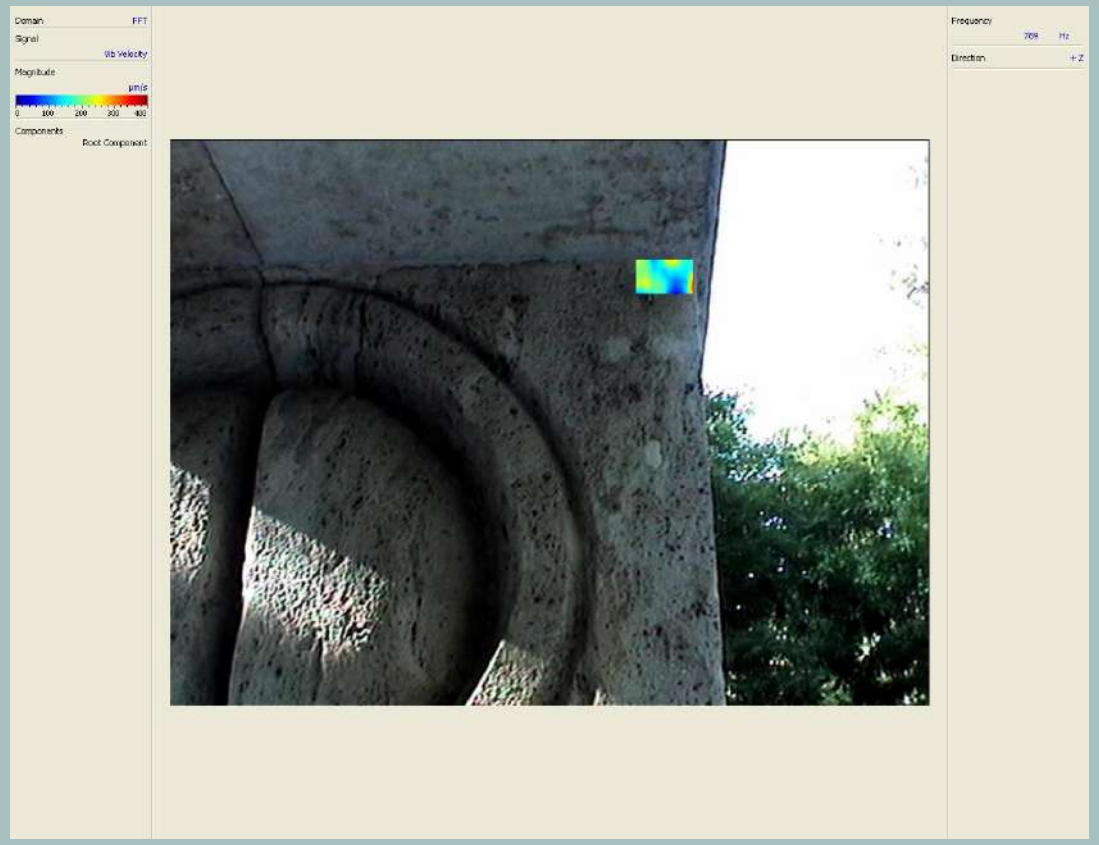
Zone 3/2015:

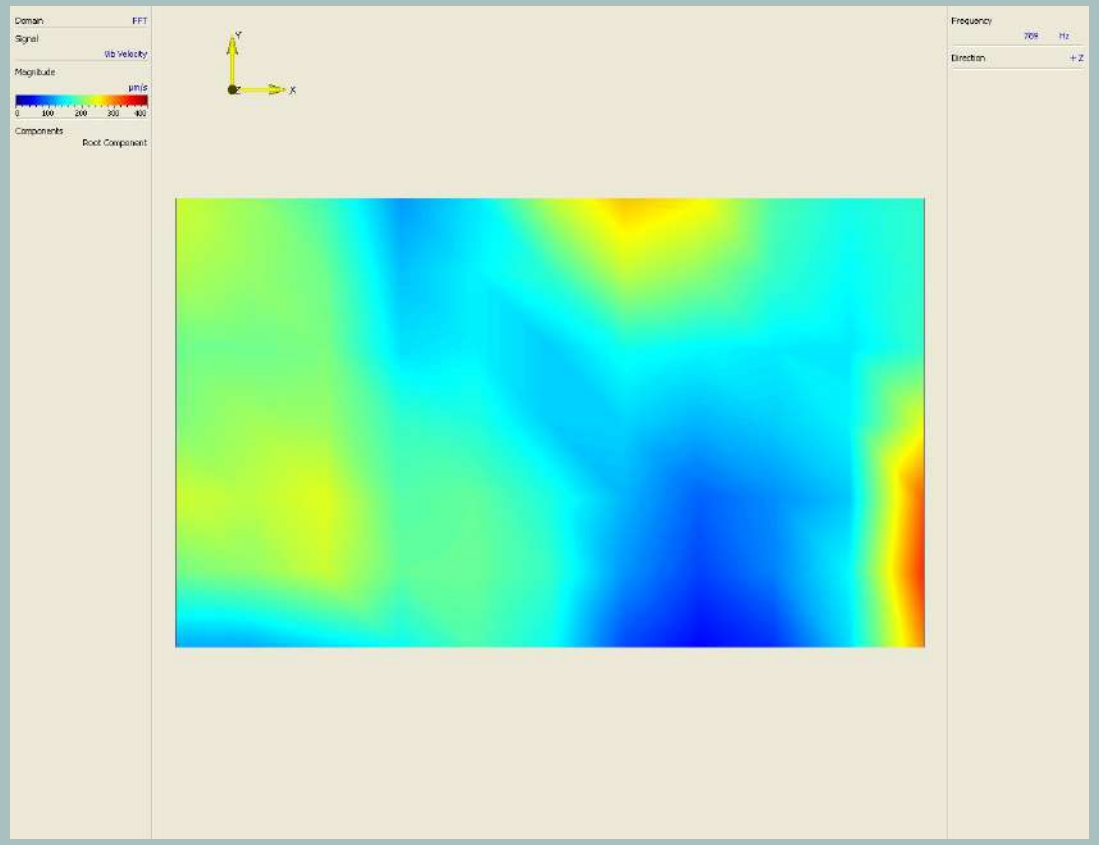
Scanning points: 77

Burst Random

Function generator

Type: NI 671x
Signal: Burst Random
Amplitude: 5 V
Offset: 0 V
Burst start: 50 %
Burst length: 90 %
Multiple Channels: Off





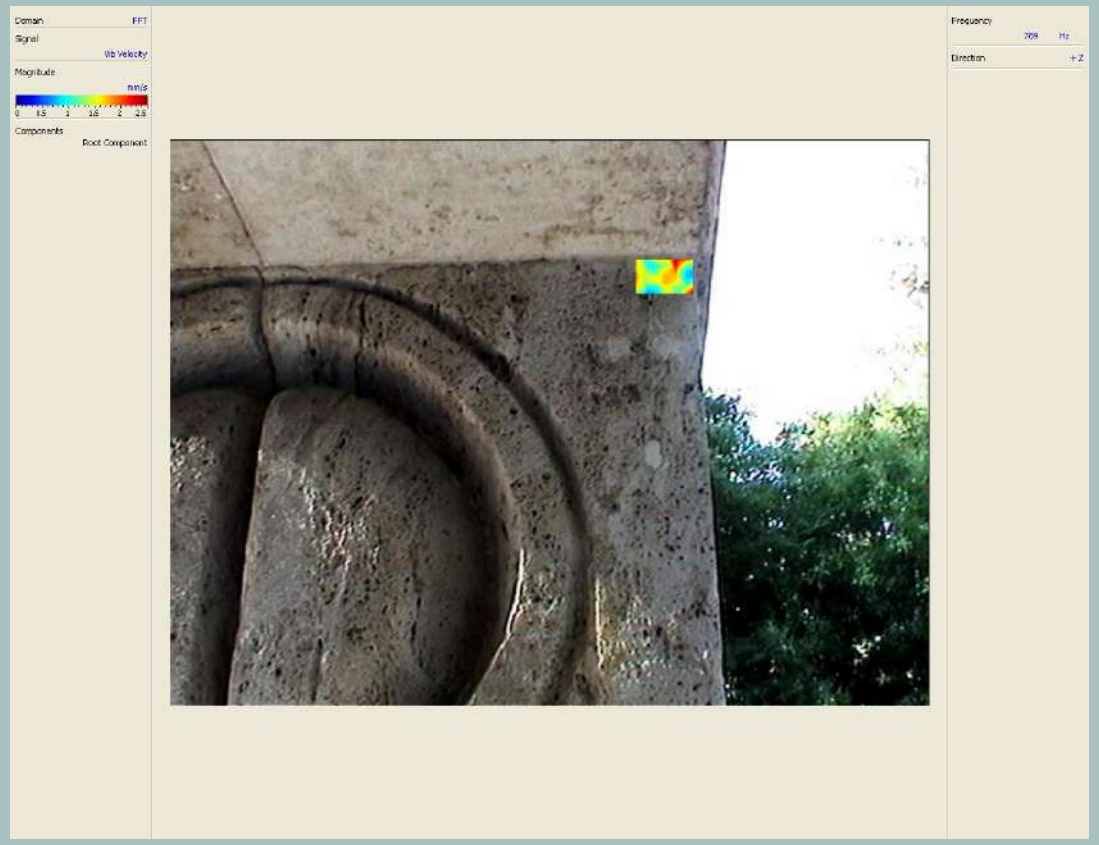
Zone 3/2016:

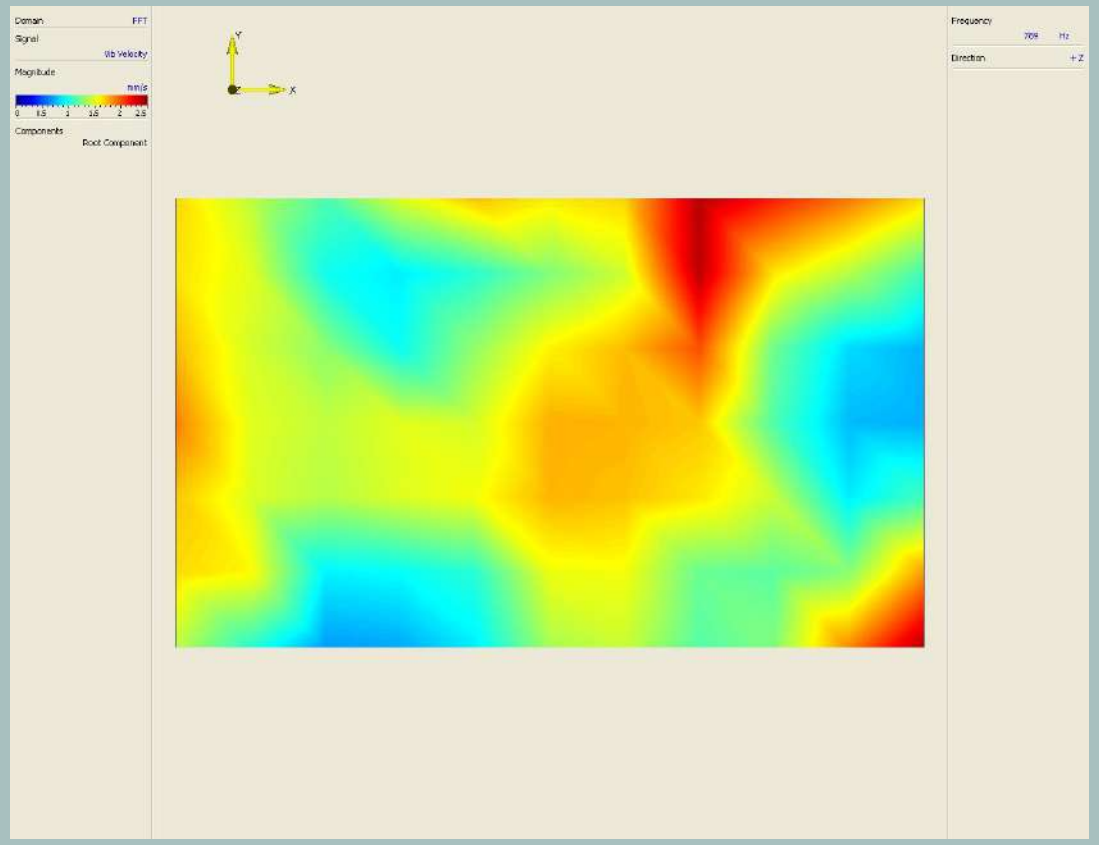
Scanning points: 77

Burst Chirp, 10 V

Function generator

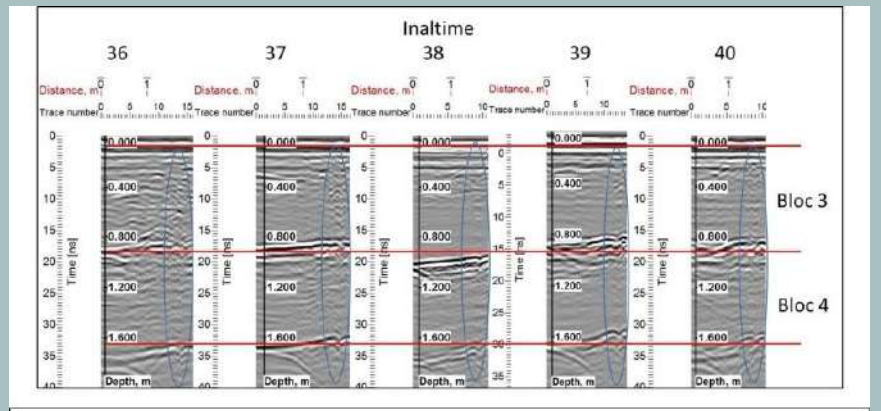
Type: NI 671x
Signal: Burst Chirp
Amplitude: 10 V
Offset: 0 V
Start frequency: 100 Hz
End frequency: 700 Hz
Burst start: 50 %
Burst length: 90 %
Multiple Channels: Off

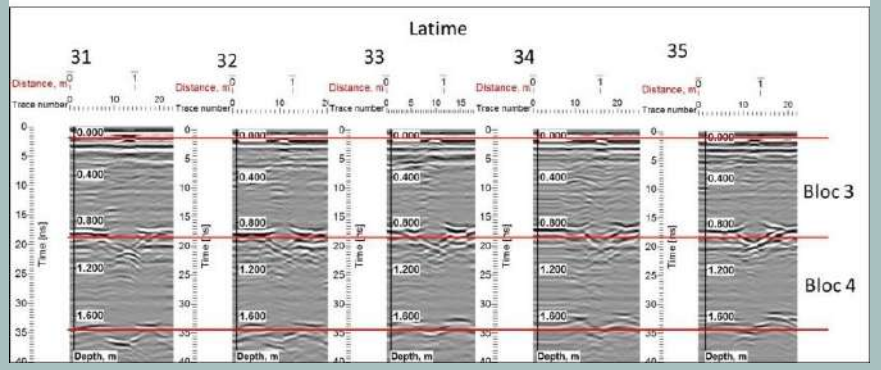


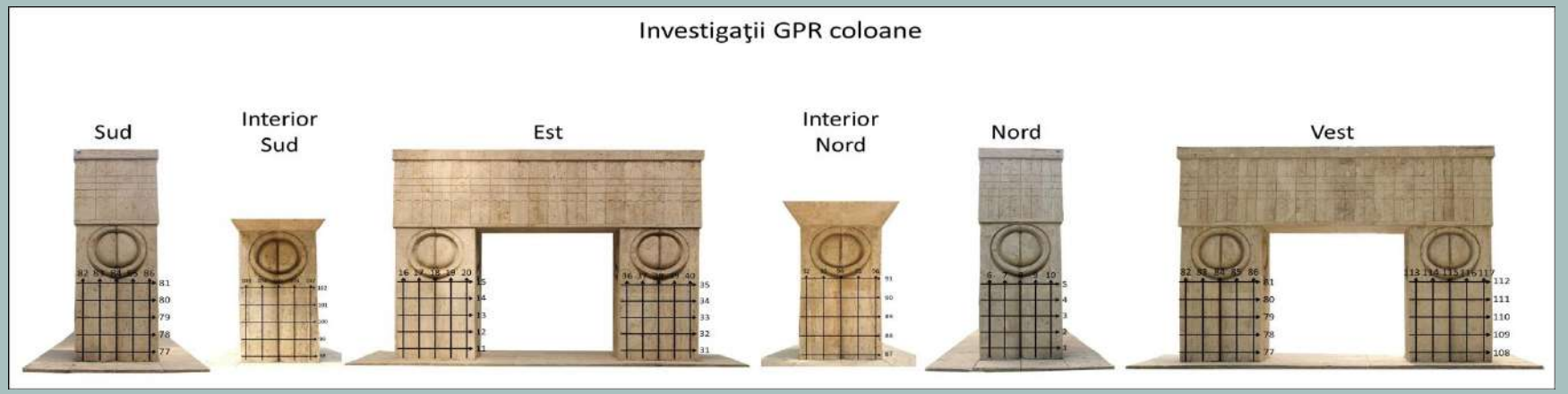


GPR on columns

- Central frequency of the antenna: 800MHz
- Time of propagation: 40 ns
- Depth = 2m
- Trigger interval: 0,13sec
- Trace: 352
- No. of records: 80

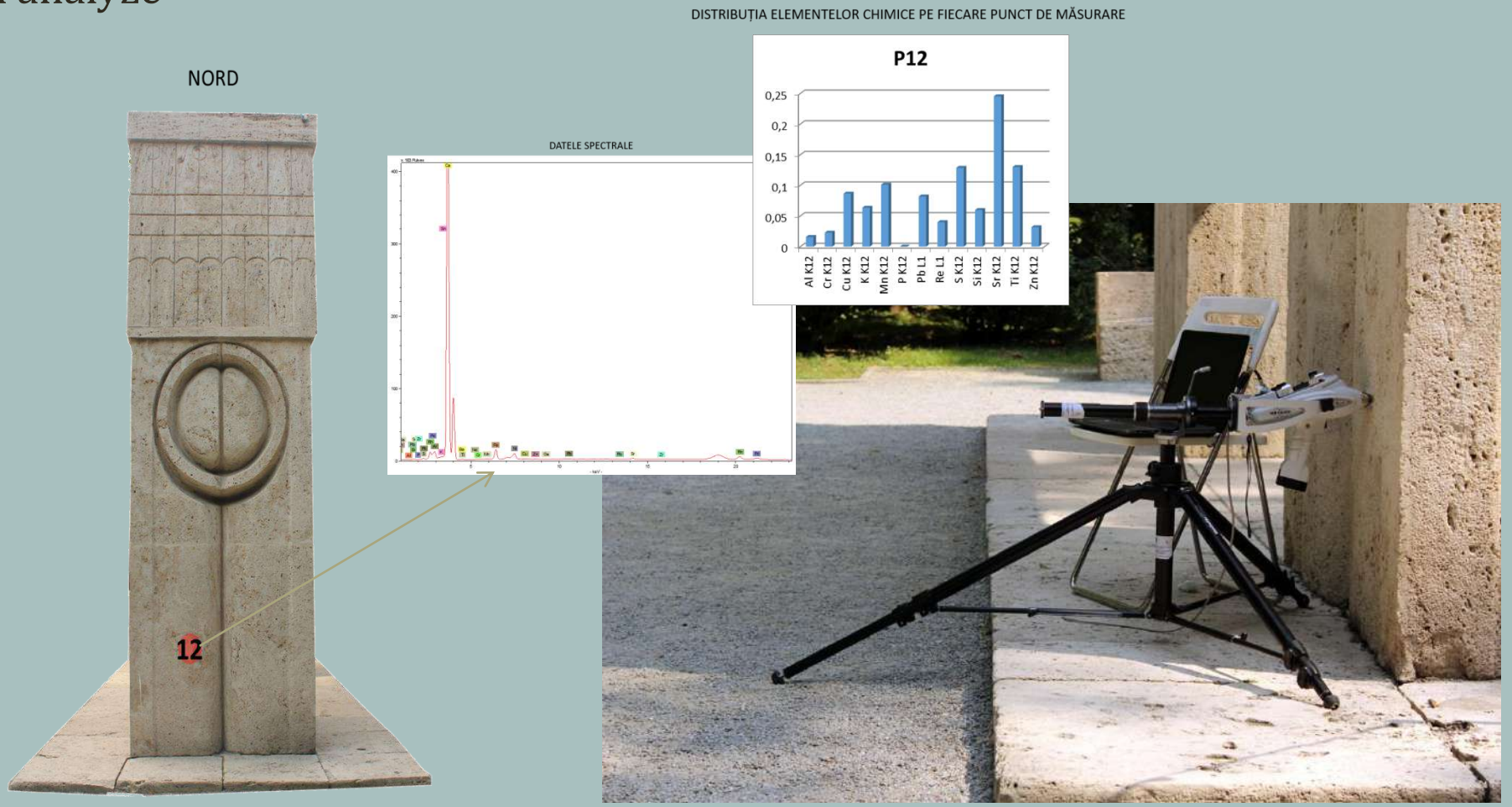




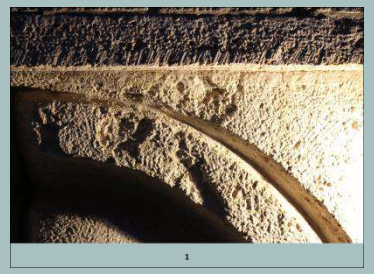


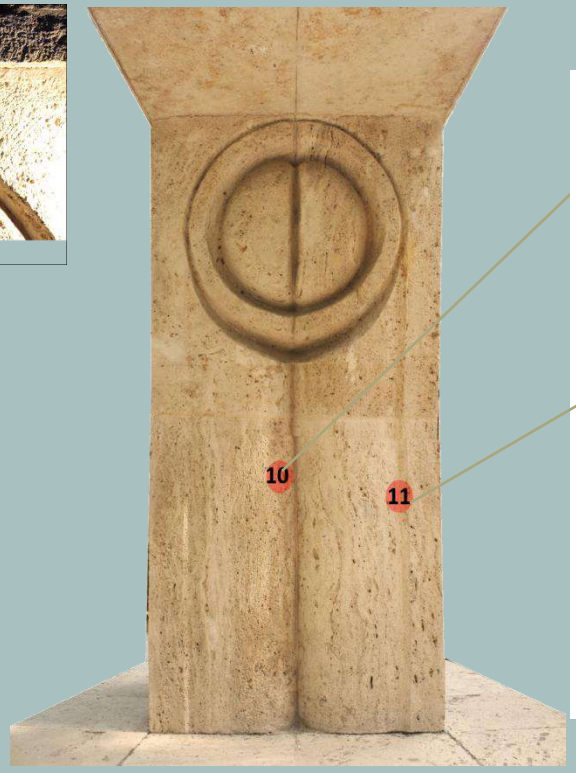
Punctual Physico-Chemical Analysis

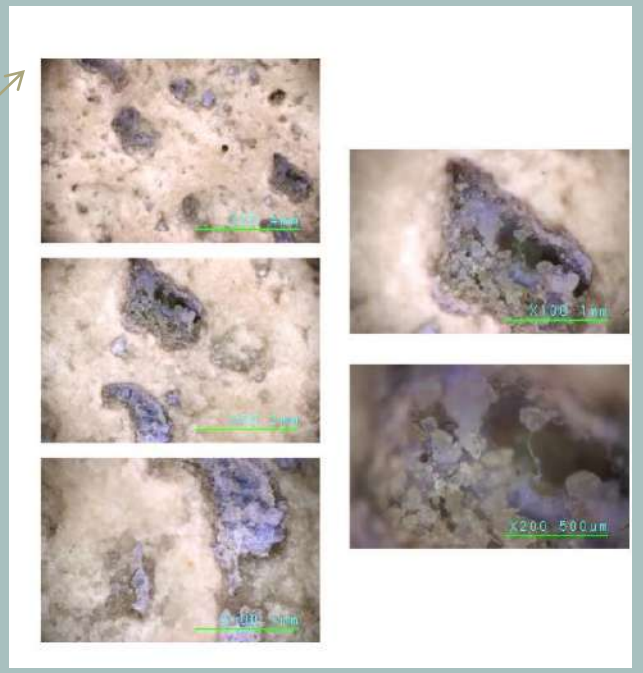
XRF elemental analyze
FTIR+FO



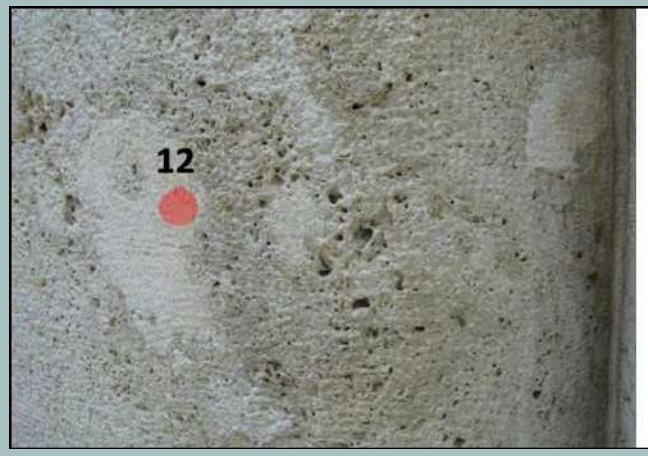
Digital Microscopy







Colorimetry



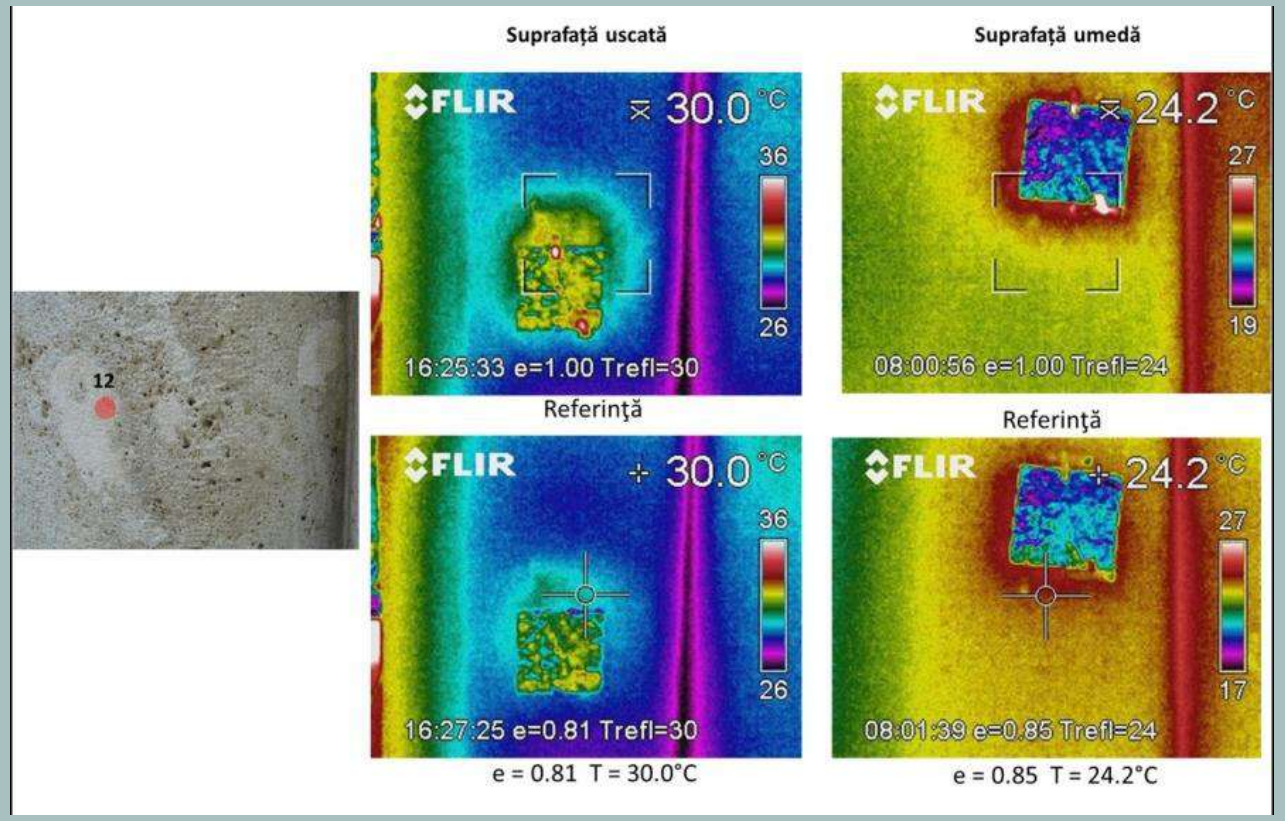
Suprafață uscată

	L*	a*	b*
12	79,13	3,02	12,5

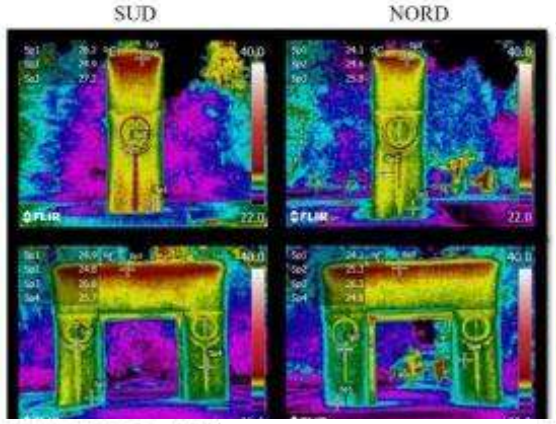
Suprafață umedă

	L*	a*	b*
12	68,63	4,53	18,60

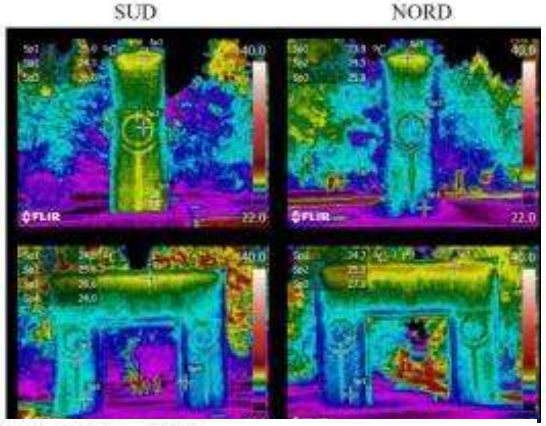
Valorile numerice ale coordonatelor de culoare în sistemul CIE L*a*b*



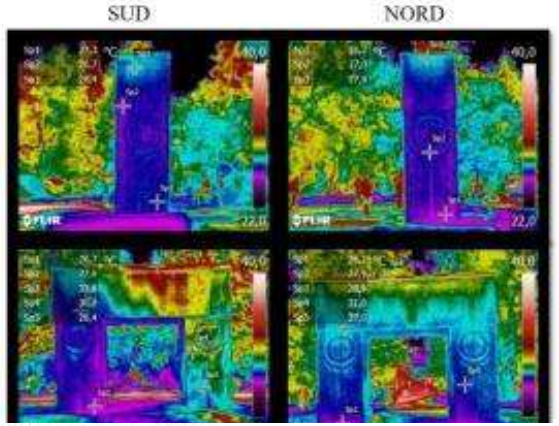
22 iulie 2015 Ora: 08:00



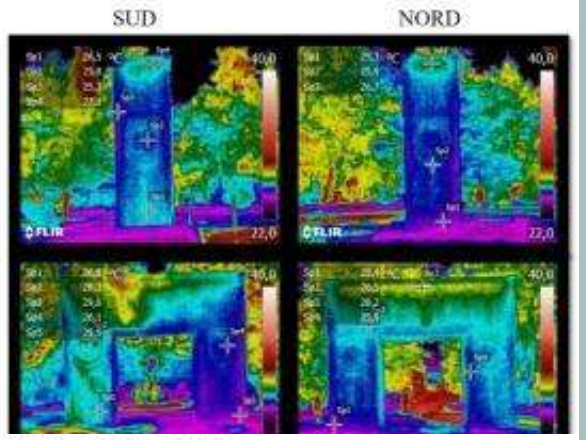
22 iulie 2015 Ora: 09:00



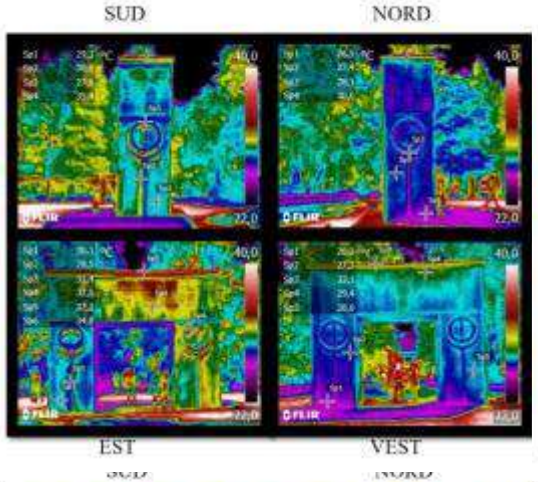
22 iulie 2015 Ora: 11:00



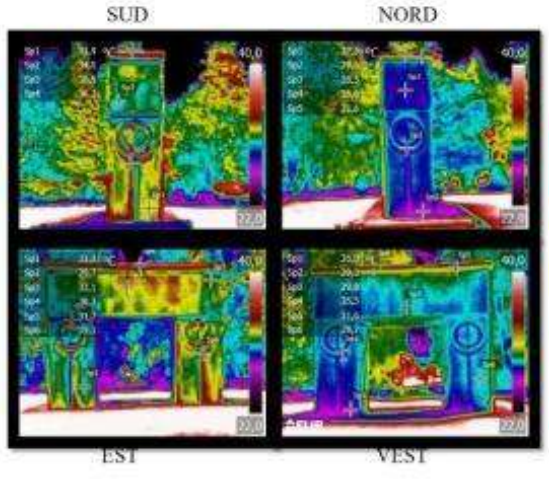
22 iulie 2015 Ora: 10:00



22 iulie 2015 Ora: 12:00

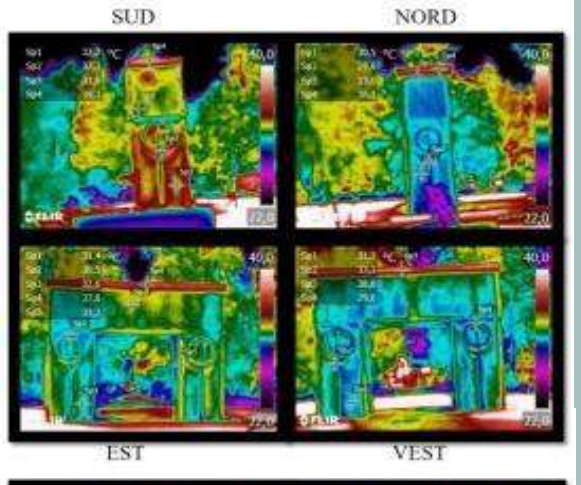


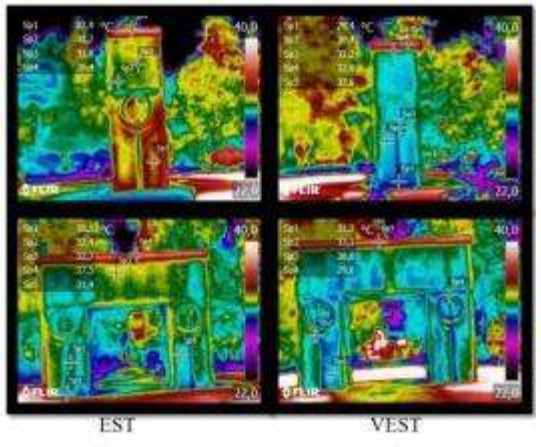
22 iulie 2015 Ora: 13:00

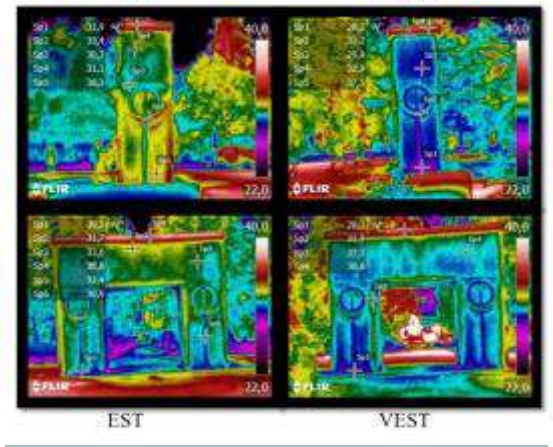


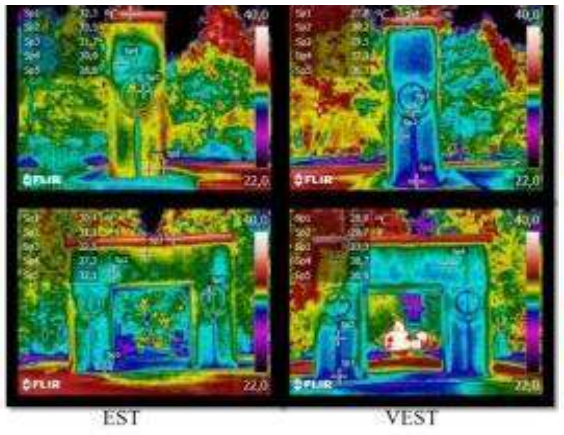
22 iulie 2015 Ora: 14:00

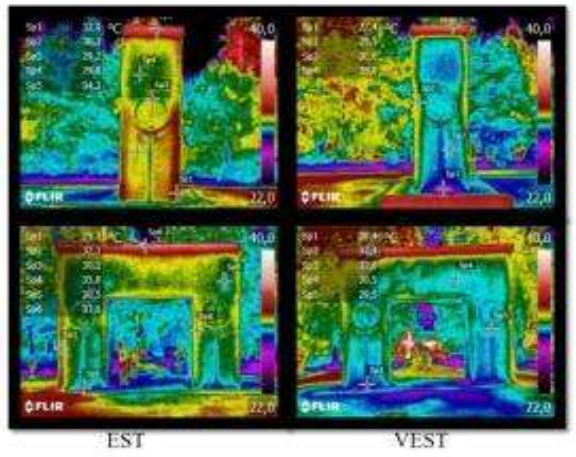
22 iulie 2015 Ora: 15:00











COLOCVIUL INTERNAȚIONAL BRÂNCUȘI

ANSAMBLUL MONUMENTAL BRÂNCUȘI 80 ANI

TÂRGU JIU

24 - 28 OCTOMBRIE 2018

Constantin Brancusi

Monumental Ensemble from Targu Jiu

Multiannual Monitoring Program

Perspectives

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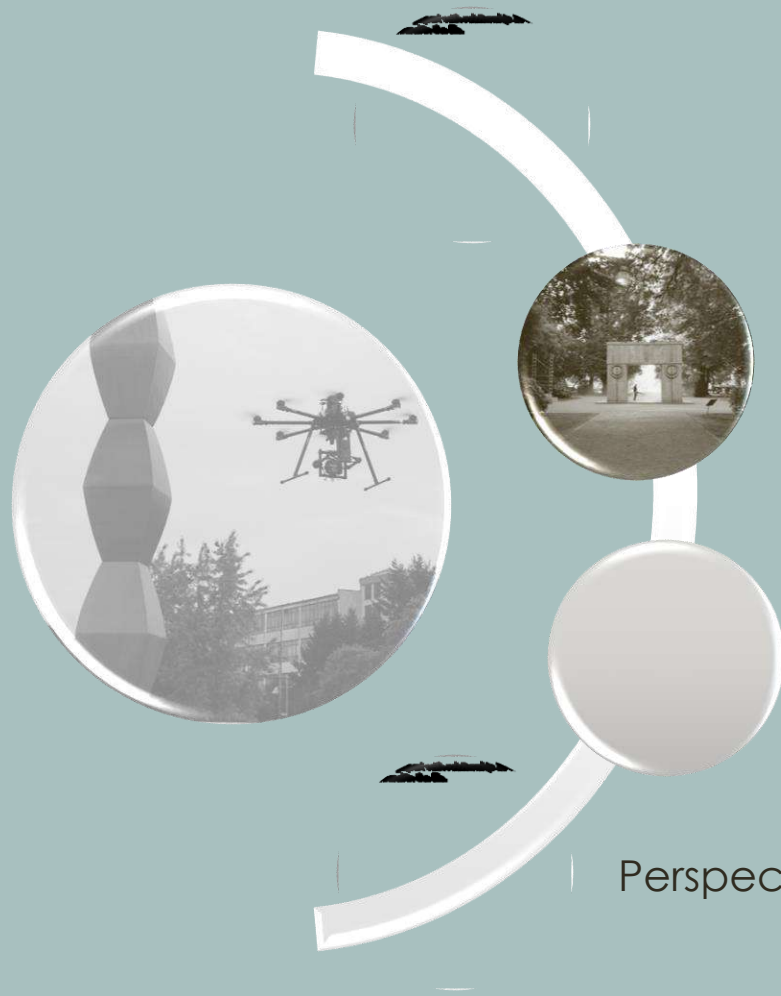


Raul Jiu

Gradina orasului

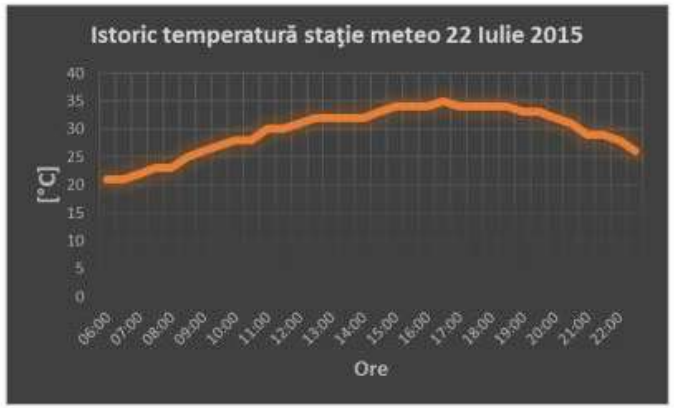
Traficul si constructiile

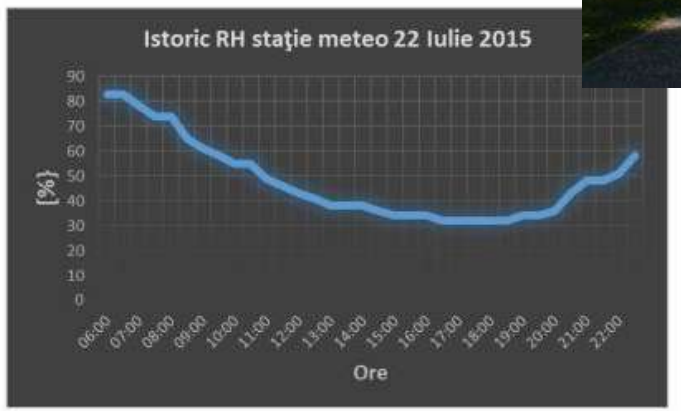
Perspectives

1.1 Microclimate

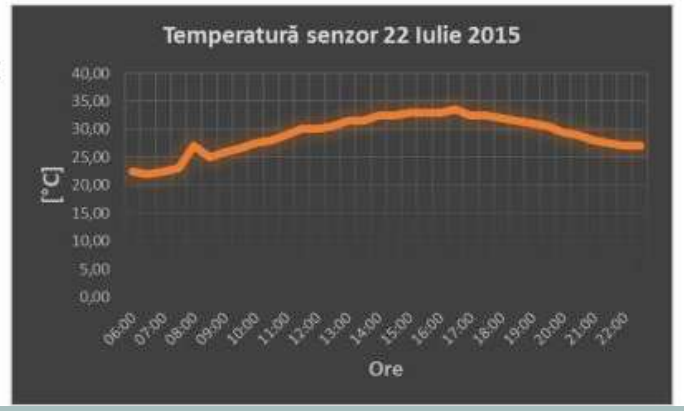
Variaţie temperatură şi RH 22 Iulie 2015

Min: 21°C
Max: 35°C

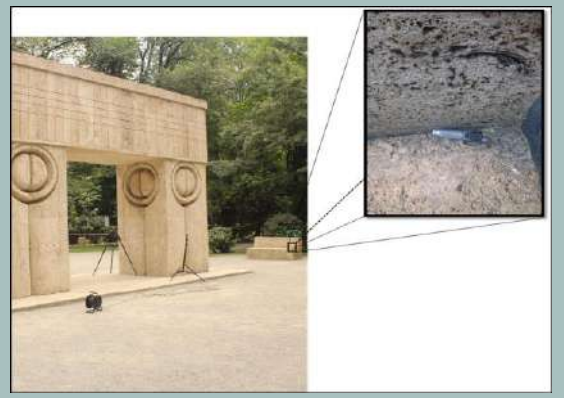




in: 22°C
ax: 33,5°C

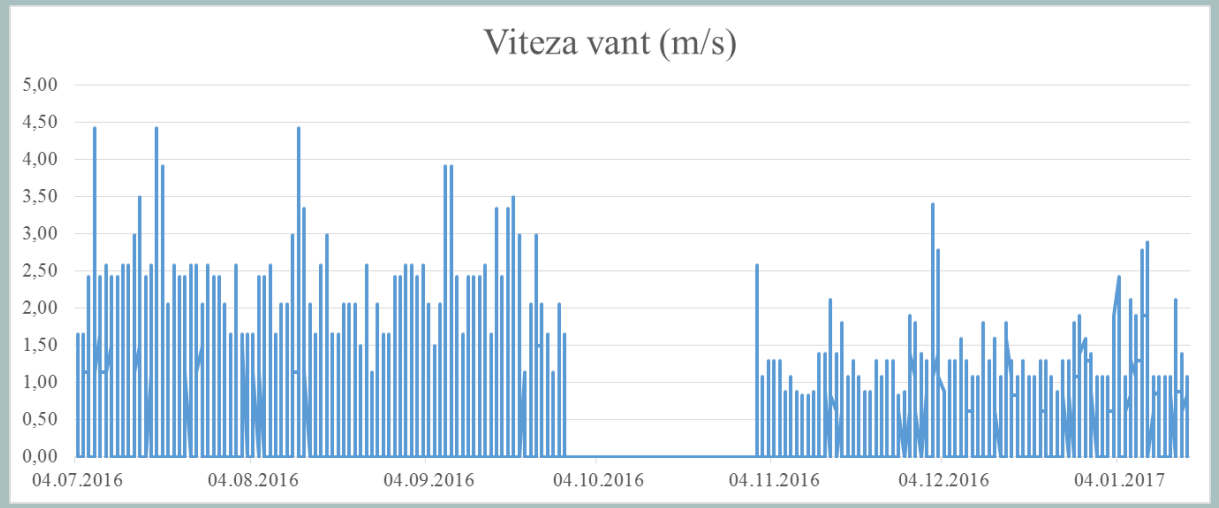


Min: 44%
Max: 73,5%

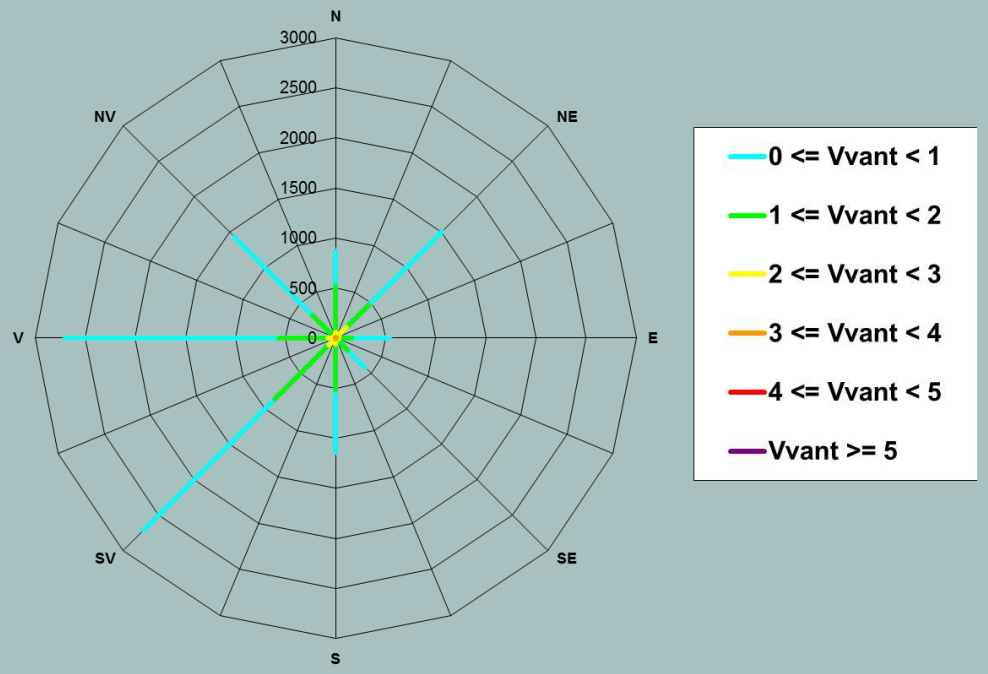


Monitorizare vant Poarta Sarutului, Tg. Jiu

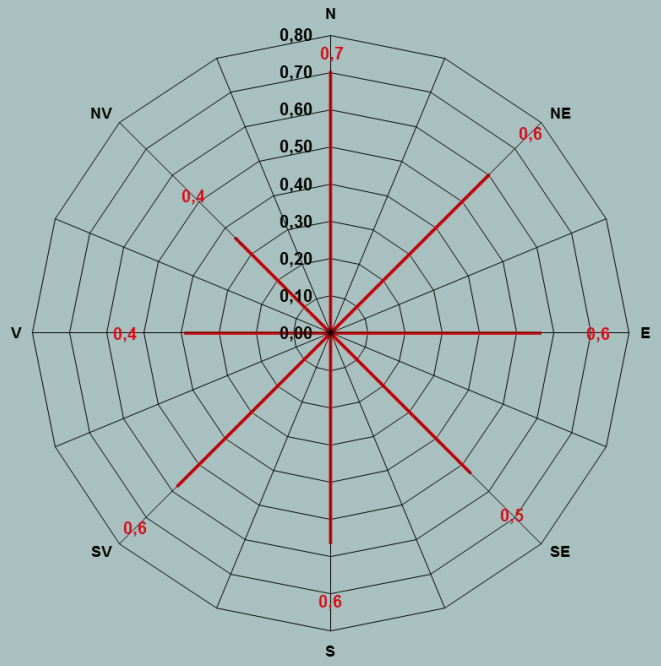
Perioada monitorizata: 6 luni (Iulie 2016- Ianuarie 2017)

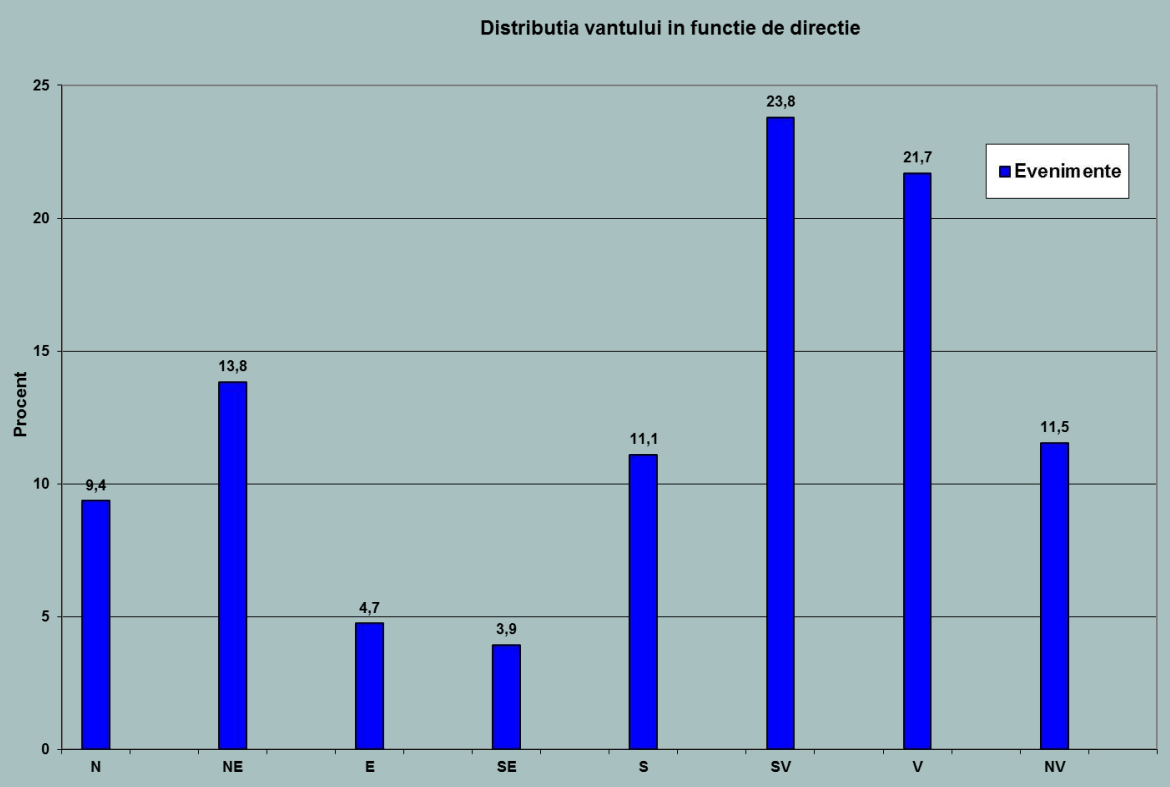


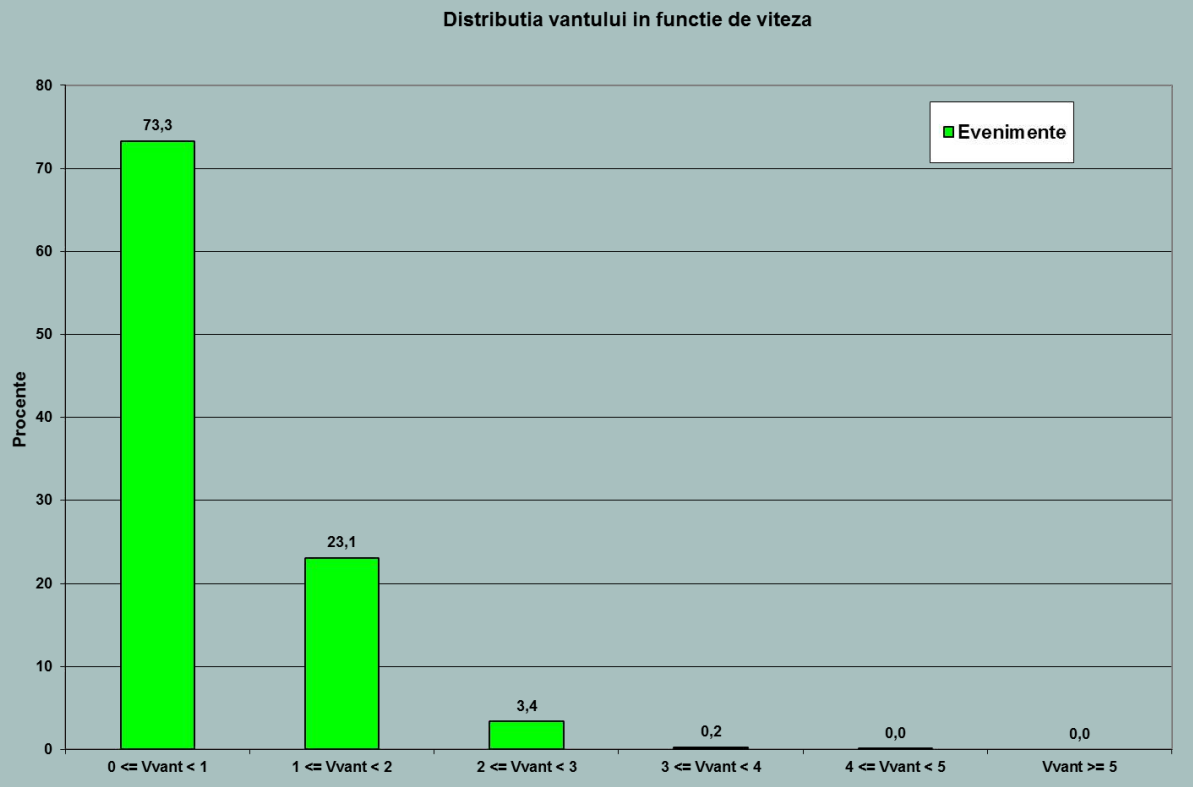
Directie si frecventa vant



Directie si viteza medie vant (m/s)




Distributia vantului in functie de directie
Procent
25
20
15
10
5
0
Evenimente
9,4
13,8
4,7
3,9
11,1
23,8
21,7
11,5
N
NE
E
SE
S
SV
V
NV


Distributia vantului in functie de viteza
Procente
80
70
60
50
40
30
20
10
0
Evenimente
73,3
23,1
3,4
0,2
0,0
0,0
0 <= Vvant < 1
1 <= Vvant < 2
2 <= Vvant < 3
3 <= Vvant < 4
4 <= Vvant < 5
Vvant >= 5

Perspectives

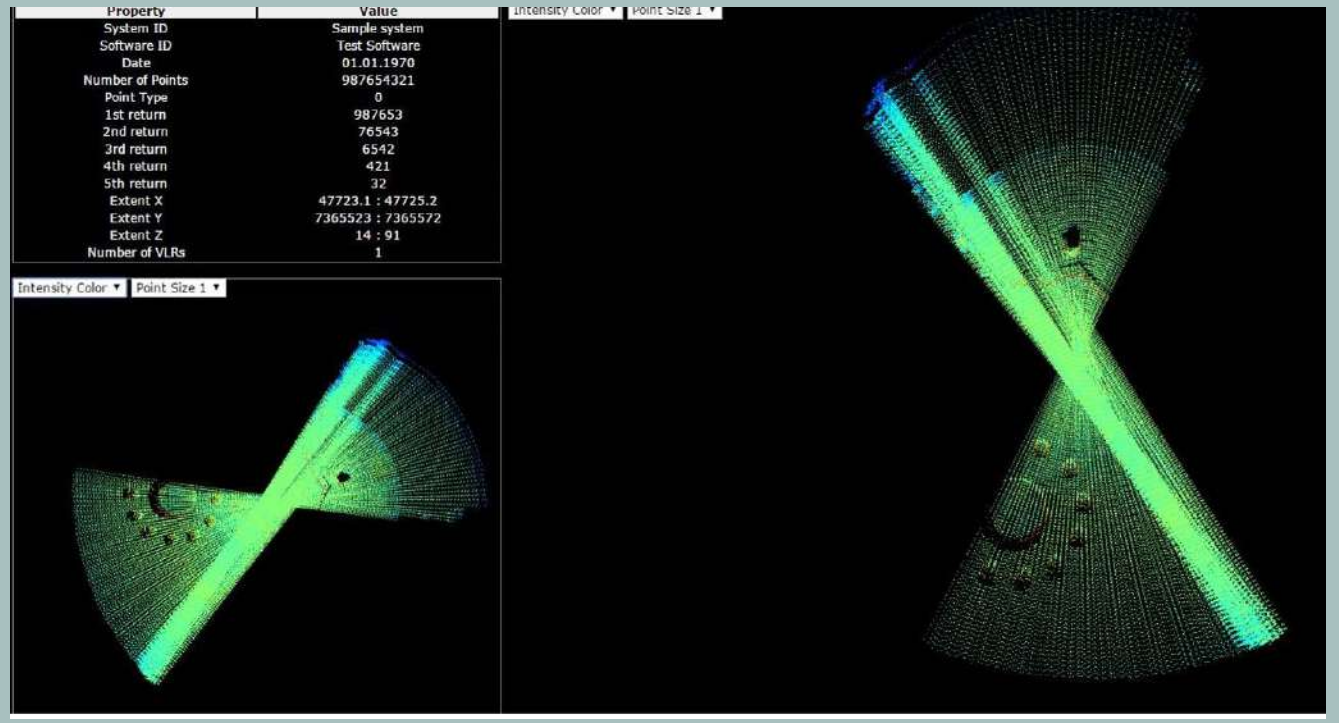
Suvey with UAV and sensors:

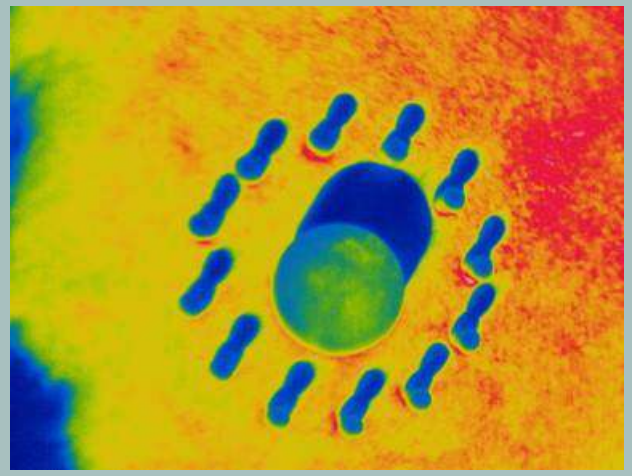
- Thermal distribution
- Digital photography
- LIDAR
- Extended control

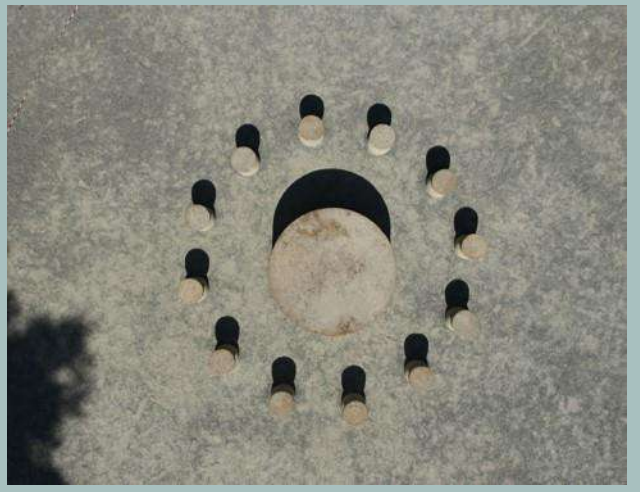
  hiperspectral band (950 – 2500nm)

  multispectral band (400-1150nm)

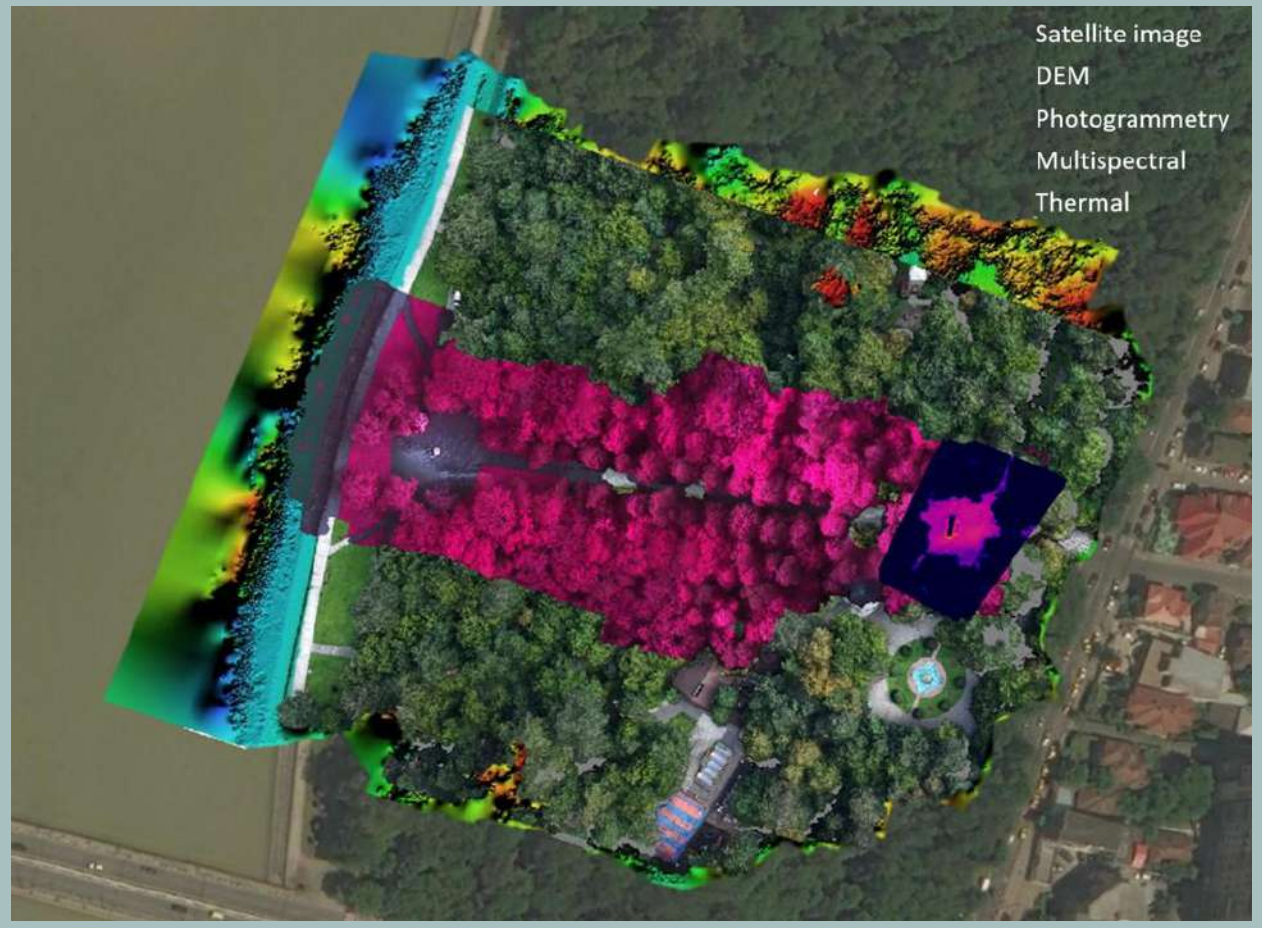
Anthropic factors impact limitation







OVER JIU


Satellite image
DEM
Photogrammetry
Multispectral
Thermal

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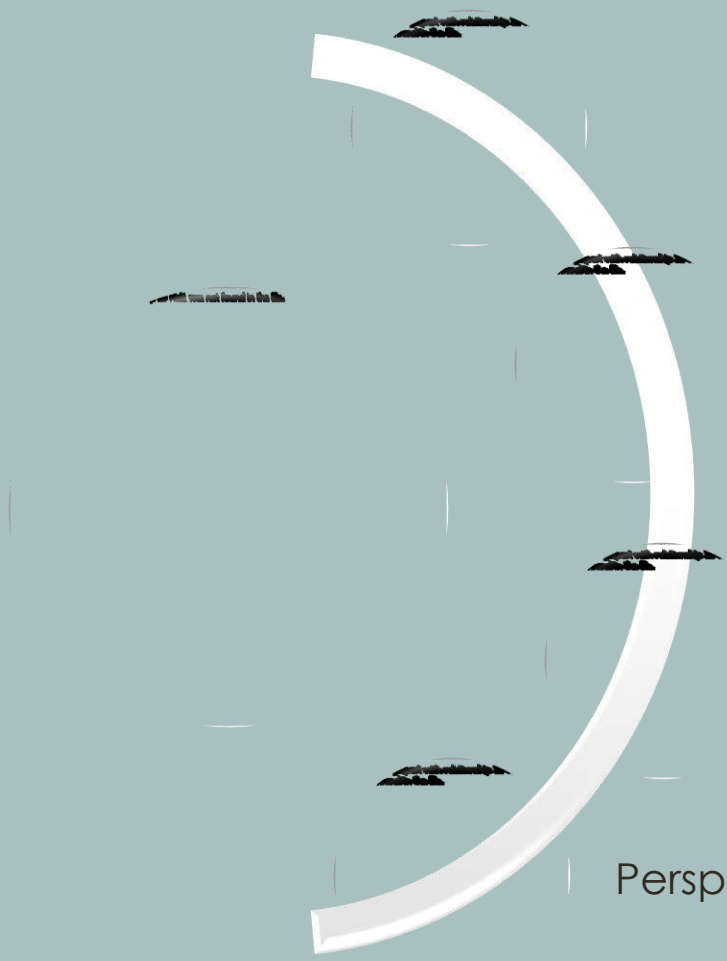

Raul Jiu

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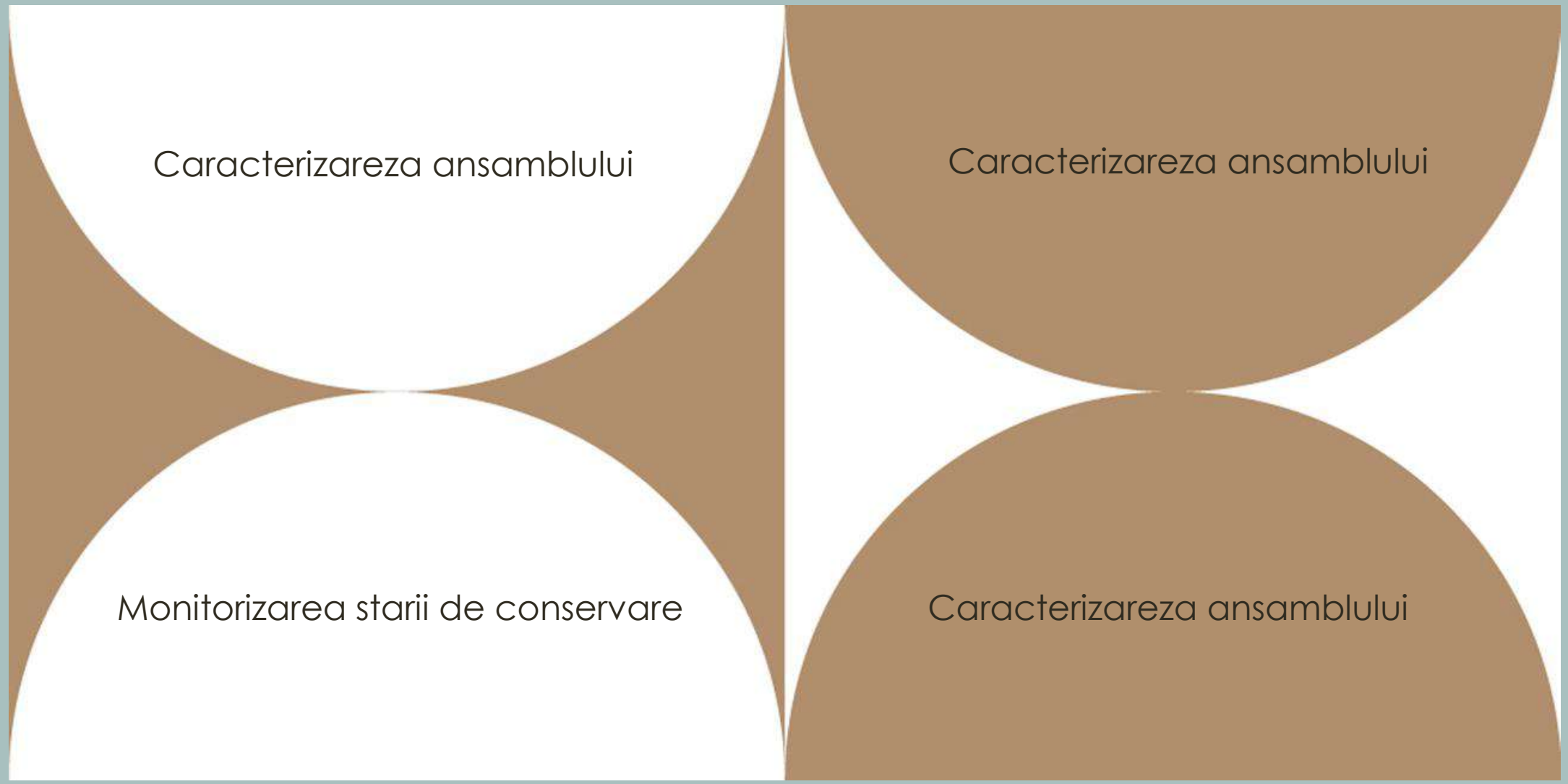
Caracterizareza ansamblului
Caracterizareza ansamblului
Monitorizarea starii de conservare
Caracterizareza ansamblului

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