

Advanced systems for prevention and early detection of forest fires



ASPIres

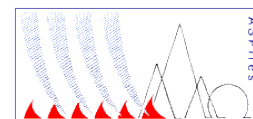
Advanced systems for prevention & early detection of

Advanced systems for prevention & early detection of forest fires (ASPIres)

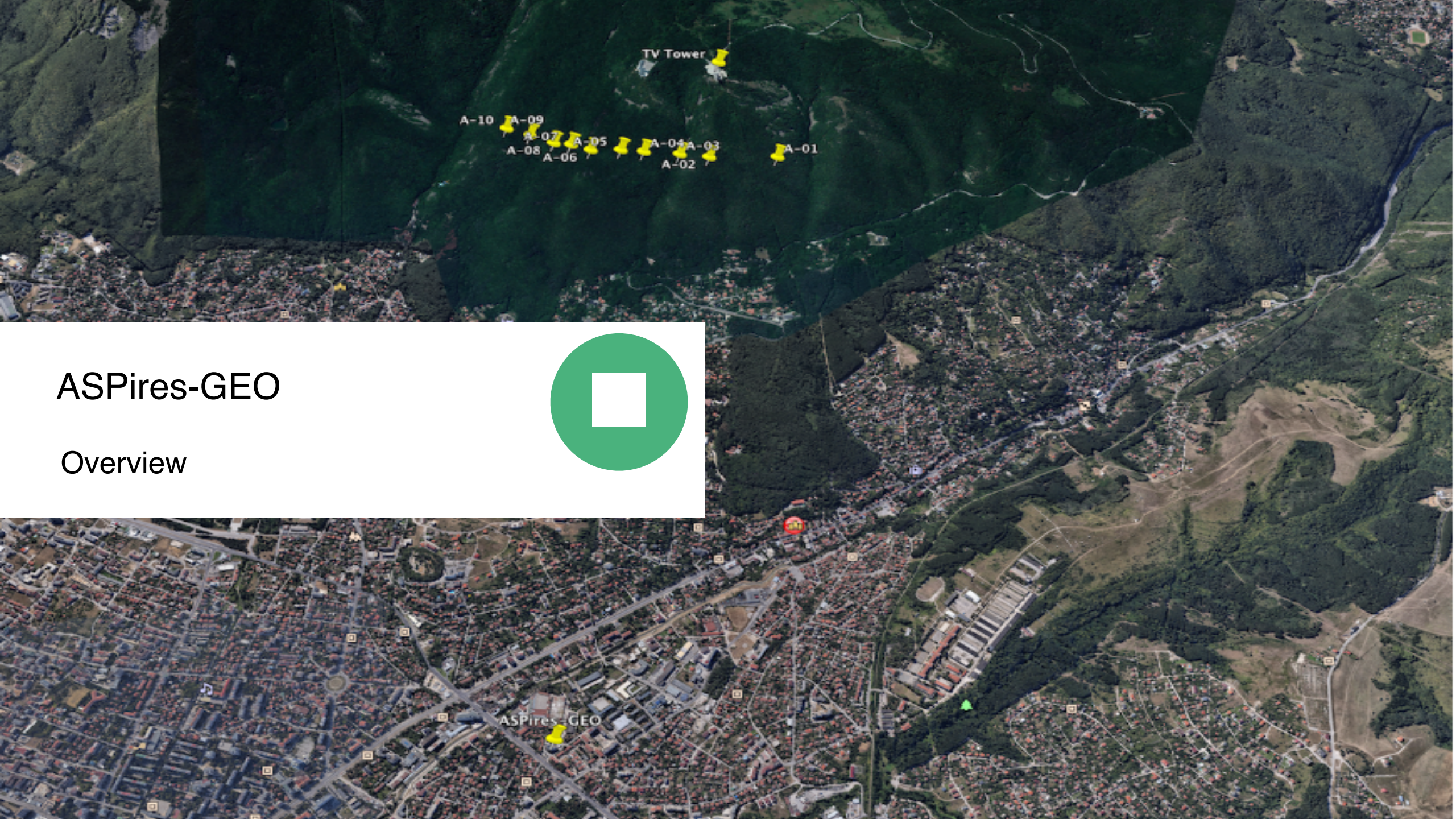
ASPIres-GEO

Mag. Plamen Kirov

Project financed under the Civil Protection Programme Call 2016:
Agreement No.: ECHO/ SUB/2016/742906/PREV03 by European Commission:
DG for European Civil Protection and Humanitarian Aid Operations (ECHO)

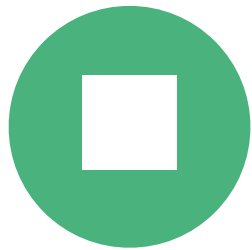


Advanced systems for prevention
and early detection of forest fires

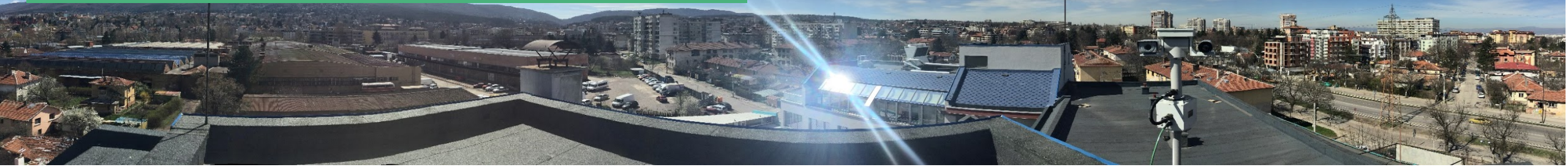


ASpires-GEO

Overview



Overview

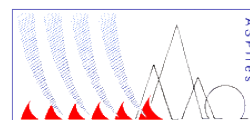


❓ The main goal of the ASPires platform is to collect online data from different types of sensors, organize them in the Cloud database and create correlations for these data.

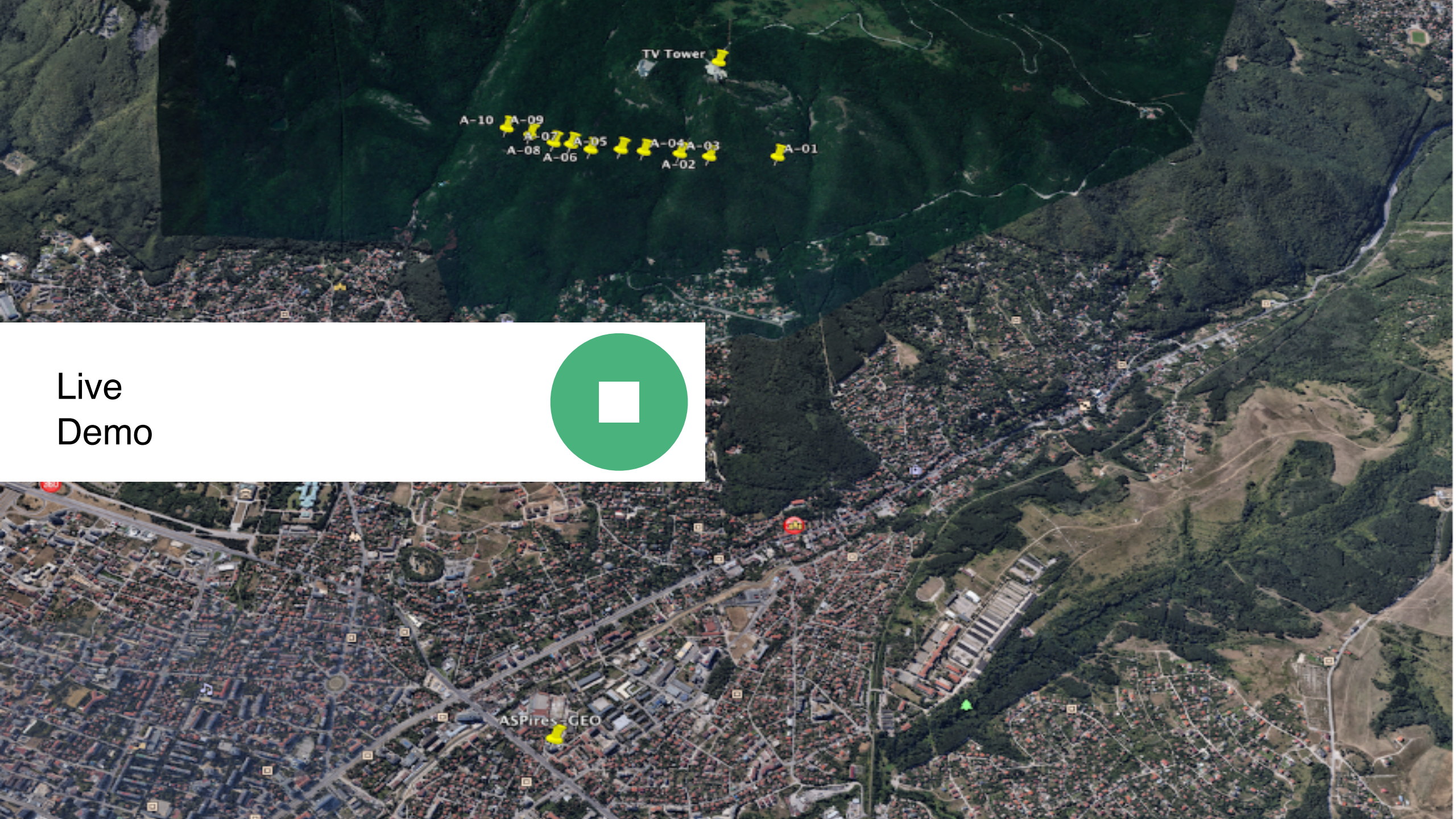
❓ ASPires-GEO is a model that includes standard high-tech equipment located on stationary towers in forest areas and used for early detection of forest fires.

❓ The purpose of this model is to demonstrate and to prove the working ability of the ASPires platform.

❓ ASPires-GEO is installed stationary in Sofia, Bulgaria at the foot of Vitosha Mountain. It is directed to Vitosha Mountain and ten predefined positions are scanned.



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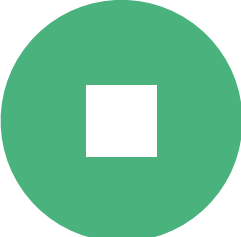


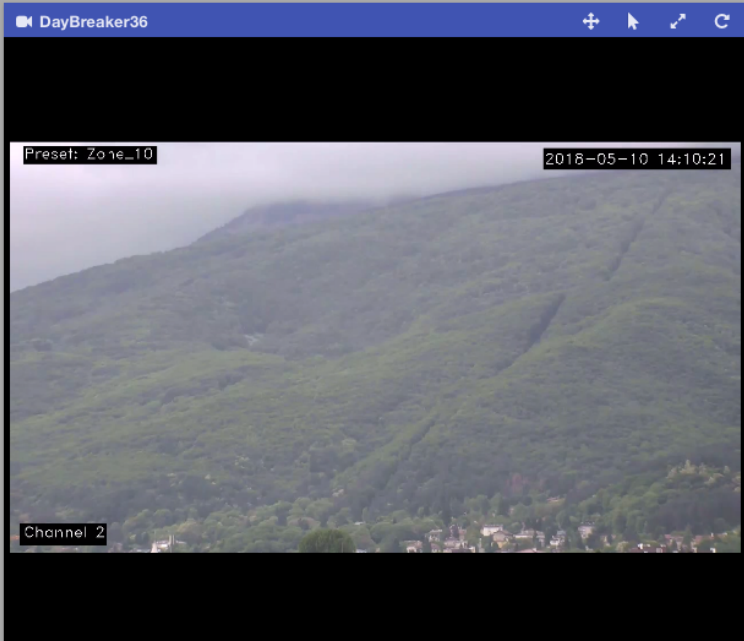
TV Tower

A-10 A-09
A-07 A-05
A-08 A-06
A-04 A-03
A-02 A-01

ASPIres GEO

Live
Demo





Log

[2018-05-10 14:10:04] Detection: No fire detected, visualizing hottest point (X: 16, Y: 479, T: 32°C).
 [2018-05-10 14:09:53] Detection: No fire detected, visualizing hottest point (X: 465, Y: 479, T: 31°C).
 [2018-05-10 14:09:00] Detection: No fire detected, visualizing hottest point (X: 12, Y: 357, T: 31°C).
 [2018-05-10 14:08:49] Detection: No fire detected, visualizing hottest point (X: 623, Y: 477, T: 33°C).
 [2018-05-10 14:08:28] Detection: No fire detected, visualizing hottest point (X: 635, Y: 466, T: 32°C).
 [2018-05-10 14:08:04] Detection: No fire detected, visualizing hottest point (X: 637, Y: 479, T: 30°C).

NVIS CH1 CH2 PT

NAVIGATION

PTZ PRESETS **TOUR**

+

ASPIres Vitosha [stop] [close]

Test [play] [close]

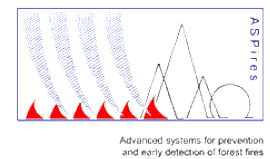
Test_3 [play] [close]

HOME **IR** DAY FIRE

Digital

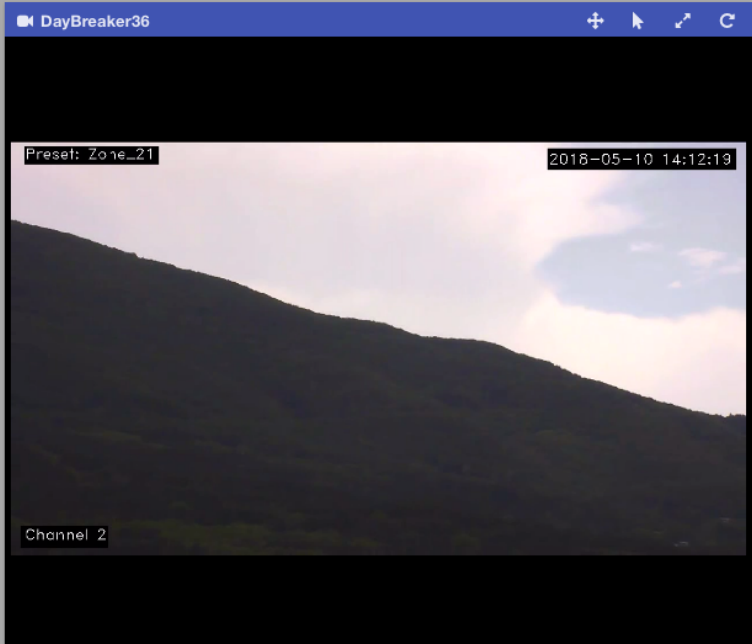
- +

POLARITY NUC **FOG** On Off



5/8/2018

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Log

[2018-05-10 14:12:13] Detection: No fire detected, visualizing hottest point (X: 0, Y: 477, T: 25°C).

[2018-05-10 14:12:02] Detection: No fire detected, visualizing hottest point (X: 0, Y: 477, T: 22°C).

[2018-05-10 14:11:51] Detection: No fire detected, visualizing hottest point (X: 105, Y: 453, T: 27°C).

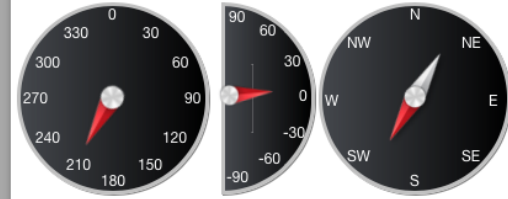
[2018-05-10 14:10:36] Detection: No fire detected, visualizing hottest point (X: 19, Y: 482, T: 31°C).

[2018-05-10 14:10:25] Detection: No fire detected, visualizing hottest point (X: 6, Y: 478, T: 29°C).

[2018-05-10 14:10:04] Detection: No fire detected, visualizing hottest point (X: 16, Y: 479, T: 32°C).

NVIS CH1 CH2 PT

NAVIGATION



PTZ PRESETS TOUR



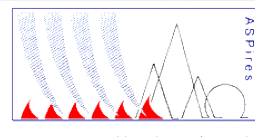
- ASPIres Vitosha [stop] [mute] [close]
- Test [play] [close]
- Test_3 [play] [close]

HOME IR DAY FIRE

Digital

- +

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Panorama

Optix IR

Preset: Zone_06 2018-05-10 15:16:39

T: 22.1deg (C)

Channel 1

DayBreaker36

Preset: Zone_06 2018-05-10 15:16:37

Channel 2

Log

- [2018-05-10 15:17:01] Detection: No fire detected, visualizing hottest point (X: 290, Y: 479, T: 27°C).
- [2018-05-10 15:16:50] Detection: No fire detected, visualizing hottest point (X: 18, Y: 443, T: 27°C).
- [2018-05-10 15:16:39] Detection: No fire detected, visualizing hottest point (X: 619, Y: 478, T: 22°C).
- [2018-05-10 15:16:28] Detection: No fire detected, visualizing hottest point (X: 0, Y: 477, T: 23°C).
- [2018-05-10 15:16:17] Detection: No fire detected, visualizing hottest point (X: 4, Y: 479, T: 27°C).
- [2018-05-10 15:16:06] Detection: No fire detected, visualizing hottest point (X: 12, Y: 352, T: 24°C).

NVIS CH1 CH2 PT

NAVIGATION

PTZ PRESETS TOUR

+

Zone_01	▶	⚙️	✖️
Zone_02	▶	⚙️	✖️
Zone_03	▶	⚙️	✖️
Zone_04	▶	⚙️	✖️

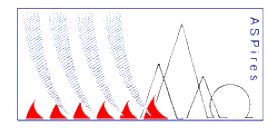
HOME IR DAY FIRE

Digital

- +

POLARITY NUC FOG On Off

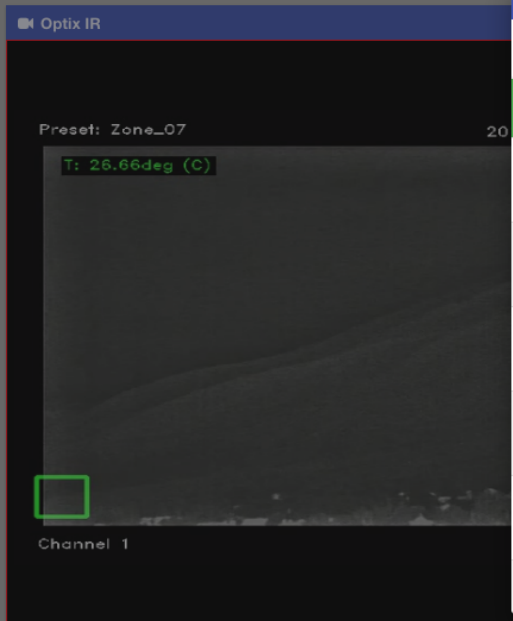
PATROLLING (ASPIRES VITOSHA)



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Menu "Gallery"

SCREENSHOTS VIDEO FIRE

Name	Date	Size		
day_10-05-2018_07-42-54.mp4	2018-05-10 10:34:39	1,303KB	▶	✕
ir_10-05-2018_07-42-54.mp4	2018-05-10 10:34:38	1,669KB	▶	✕
ir_10-05-2018_10-34-26.jpg	2018-05-10 10:34:26	107KB	▶	✕
day_10-05-2018_10-34-26.jpg	2018-05-10 10:34:26	160KB	▶	✕
day_10-05-2018_07-42-54.jpg	2018-05-10 07:42:55	123KB	▶	✕
ir_10-05-2018_07-42-54.jpg	2018-05-10 07:42:54	88KB	▶	✕

Log

[2018-05-10 15:17:56] Detection: No fire detected, visualizing hottest point (X: 637, Y: 479, T: 23°C).

[2018-05-10 15:17:45] Detection: No fire detected, visualizing hottest point (X: 22, Y: 462, T: 26°C).

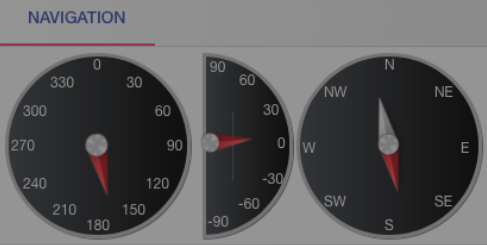
[2018-05-10 15:17:34] Detection: No fire detected, visualizing hottest point (X: 10, Y: 479, T: 25°C).

[2018-05-10 15:17:23] Detection: No fire detected, visualizing hottest point (X: 605, Y: 472, T: 24°C).

[2018-05-10 15:17:12] Detection: No fire detected, visualizing hottest point (X: 15, Y: 479, T: 30°C).

[2018-05-10 15:17:01] Detection: No fire detected, visualizing hottest point (X: 290, Y: 479, T: 27°C).

NVIS CH1 CH2 PT



- PTZ PRESETS TOUR
- +
- Zone_01 ▶ ⚙️ ✕
 - Zone_02 ▶ ⚙️ ✕
 - Zone_03 ▶ ⚙️ ✕
 - Zone_04 ▶ ⚙️ ✕

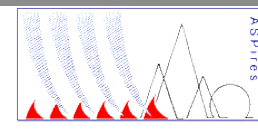
HOME IR DAY FIRE

Digital

- +

POLARITY NUC FOG

On Off



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Optix IR

DayBreaker36

Settings

GENERAL SYSTEM JOYSTICK USERS NETWORK **FIRE SETTINGS** NOTIF

Fire pre-alarm degrees: 60

Fire alarm degrees: 80

Surrounding temperature: 5

SAVE



Log

[2018-05-10 15:18:51] Detection: No fire detected, visualizing hottest point (X: 0, Y: 471, T: 23°C).

[2018-05-10 15:18:40] Detection: No fire detected, visualizing hottest point (X: 615, Y: 468, T: 23°C).

[2018-05-10 15:18:29] Detection: No fire detected, visualizing hottest point (X: 19, Y: 442, T: 23°C).

[2018-05-10 15:18:18] Detection: No fire detected, visualizing hottest point (X: 21, Y: 479, T: 25°C).

[2018-05-10 15:18:18] optix opened menu 'Settings'.

[2018-05-10 15:18:07] Detection: No fire detected, visualizing hottest point (X: 638, Y: 479, T: 24°C).

NVIS CH1 CH2 PT

PATROLLING (ASPIRES VITOSHA)



PTZ PRESETS TOUR

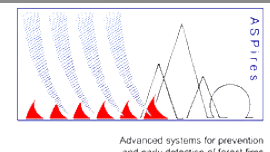
- Zone_01
- Zone_02
- Zone_03
- Zone_04

HOME IR DAY FIRE

Digital

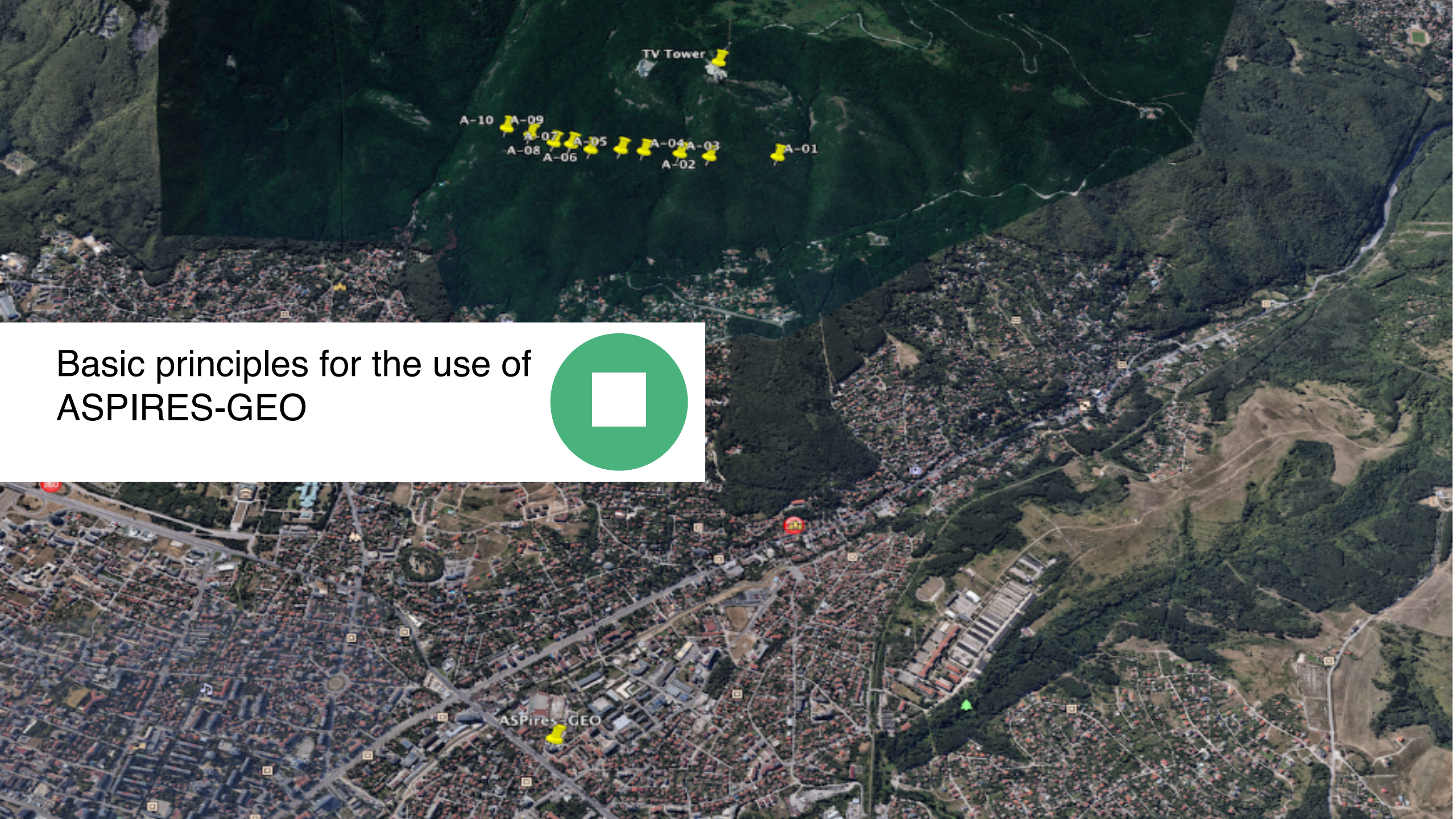
- +

POLARITY NUC FOG On Off

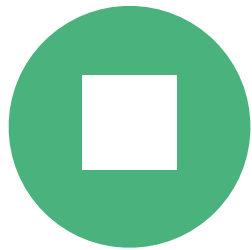


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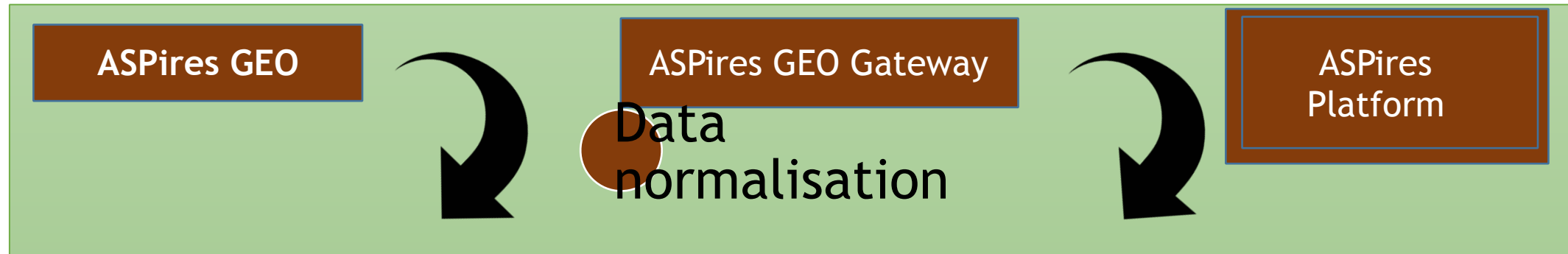
Rettmobil 2018 10



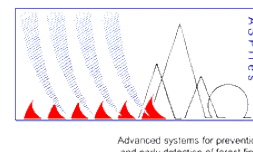
Basic principles for the use of
ASPIRES-GEO



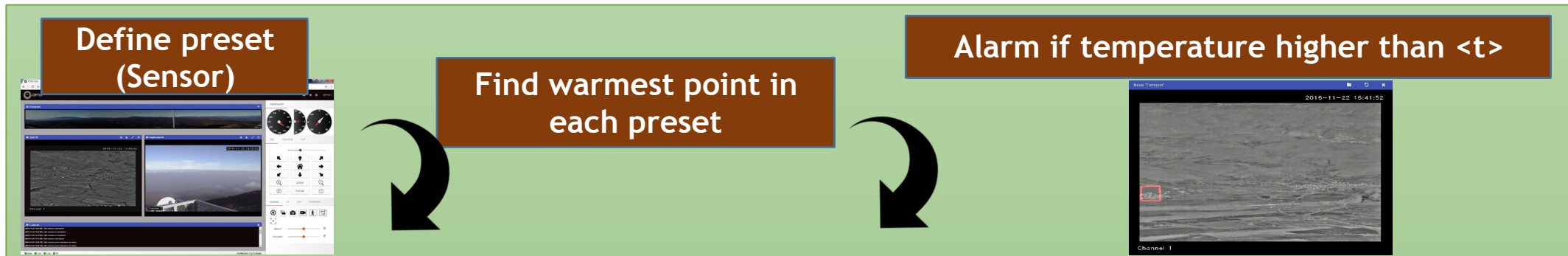
❑ First Principle



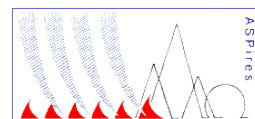
- ❑ The communication between ASPIres-GEO and the ASPIres platform is implemented through an intermediary, called ASPIres-GEO-Gateway.
- ❑ The Gateway concept allows the provision of normalised data to the ASPIres platform.
- ❑ Data normalisation allows their universal use, both individually and in conjunction with data from other types of sensors.



❑ Second Principle



- ❑ The pan tilt device on which the cameras are attached is manageable.
- ❑ This allows the pre-defining of points of the forest area of the scanning area.
- ❑ Each point (PRESET) has a fixed area depending on the distance of the cameras to the scanned area.
- ❑ The Intelligent software, an element of ASPires-GEO, defines the warmest point within each PRESET.
- ❑ If the warmest element has a temperature higher than the predefined, then an alarm signal is generated.

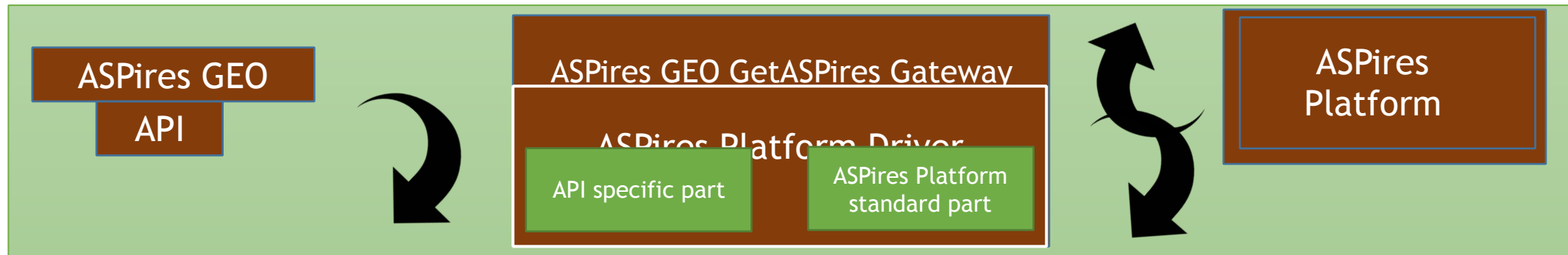


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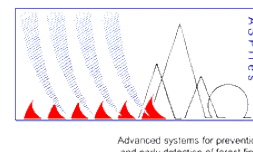
5/8/2018

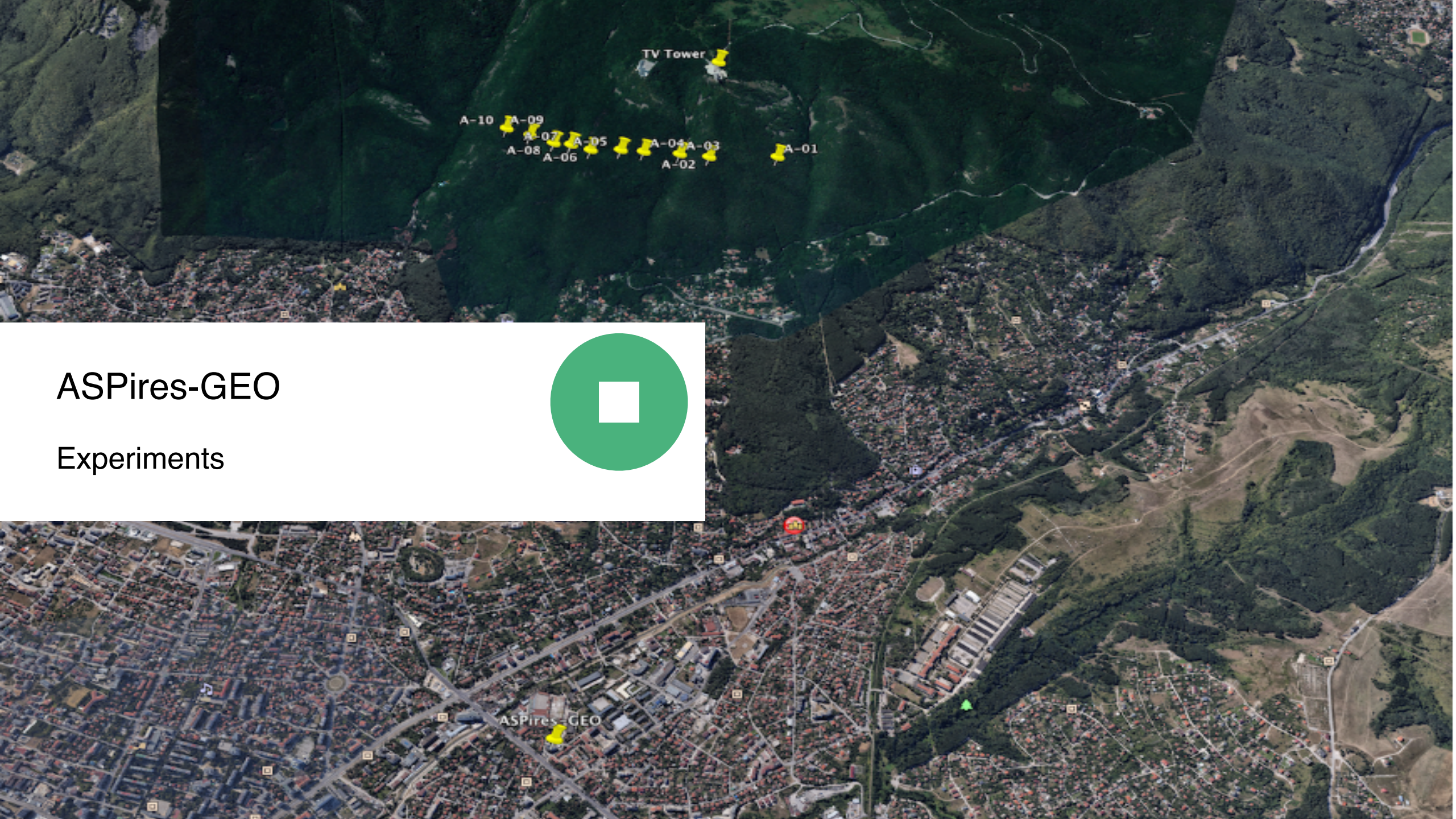
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Third Principle



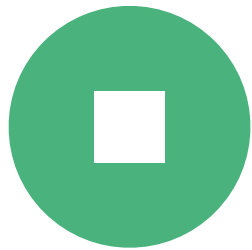
- ❑ ASPires-GEO provides an API interface.
- ❑ The API interface is specific to each technical implementation of a monitoring module.
- ❑ Through this interface, the data received from the sensors is transmitted to ASPires-GEO-Gateway.
- ❑ ASPires-GEO-Gateway includes a specialised ASPires Platform driver.
- ❑ This driver is engineered for any existing platform.





ASPIres-GEO

Experiments



ASPIRES. EXPERIMENTS IN BANSKO WITH THE PARTICIPATION OF THE LOCAL FIRE BRIGADE.

WORKSHOP 09.11.2018 BANSKO, BULGARIA

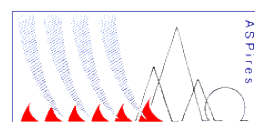


- *The experiments were carried out with the help of the local fire brigade.
- *A forest fire was simulated by **firing a ball of straw**.
- *Within a few seconds the **fire was recognized** by the ASPires-GEO and the alarm was sent to ASPires Platform.
- *ASPires Platform automatically sent **SMS** to the mobile phone numbers provided by the attendees.

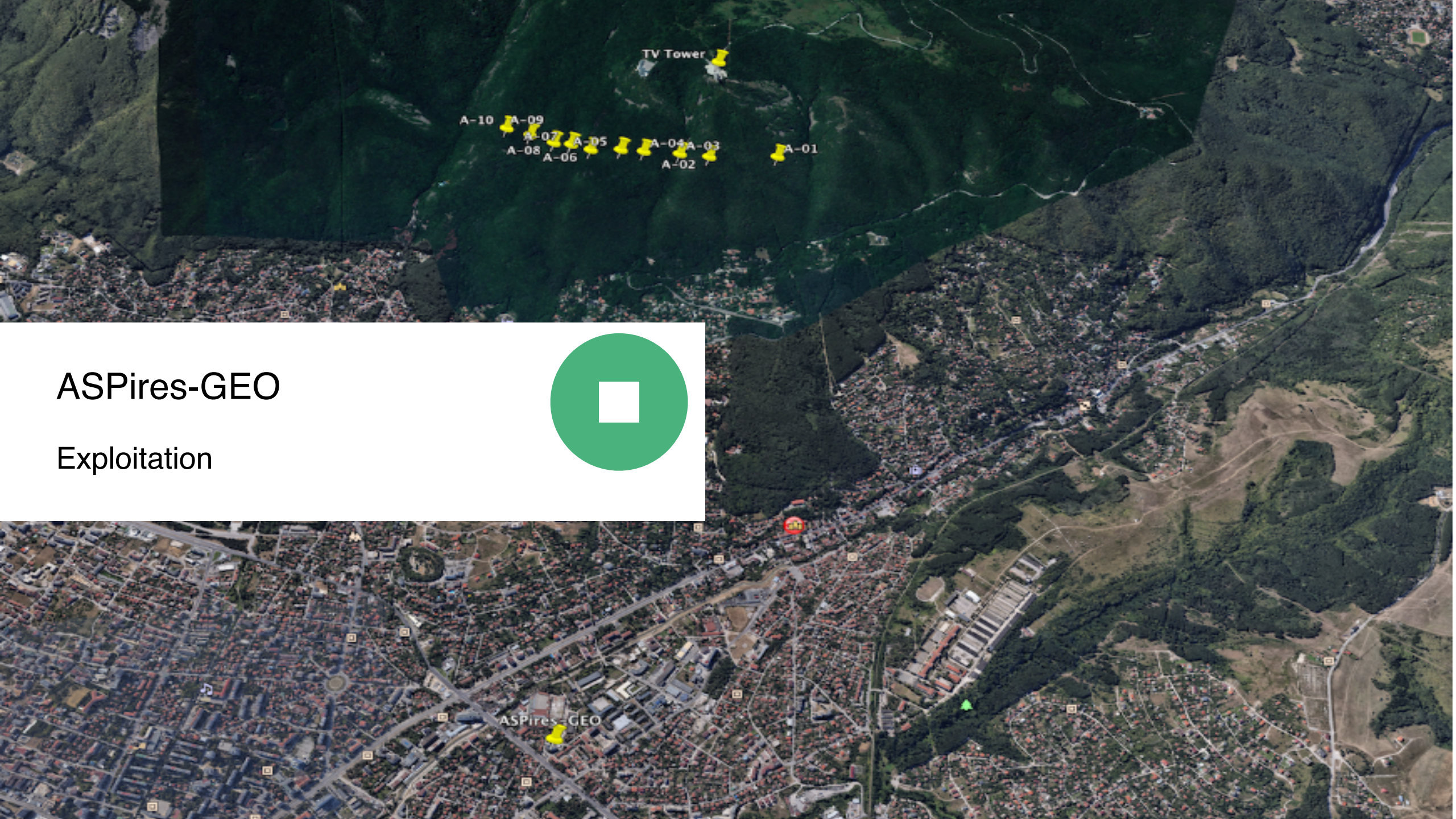
Preset: T-04

2018-11-09 10:20:10

T: 264.55deg (C)

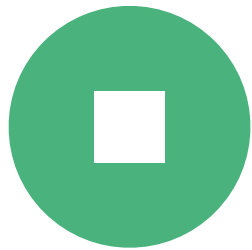


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ASpires-GEO

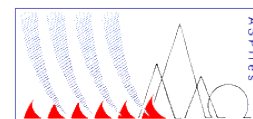
Exploitation



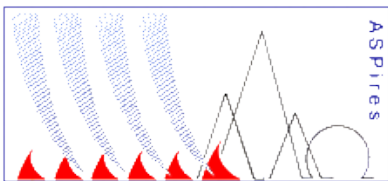


[?] The **experiments** in Bansko, Bulgaria show that the basic concepts underlying the ASPIres platform are **correct**.

[?] On request from Ministry of Interior National emergency Management authority Bulgaria, **ASPIres-GEO** will be positioned in Bansko, Bulgaria in **March 2019** for fire observation and will stay there surely until October 2019.



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Advanced systems for prevention and early detection of forest fires



ASPIres

Thank You!