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Satellite Information Based Solutions Office

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Satellite Projects Office

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Ground Segment Services Office

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WE ARE VENG.

VENG is an argentinian company of Technological Services and Developments of High Added Value, specialized in the space activity.

We offer the **space industry and high-tech consumer industry** in general, engineering and manufacturing services aimed at **solving complex problems (R + D + i)**.

VENG is the executive branch of the policies of CONAE's Access to Space, within the frame of the **National Space Program**. Its **VISION** is positioning itself as a launch service provider from Argentina to the world. Currently, it is executing, as main contractor, the development of the **Tronador II Project**.

+14 years of experience

+470 staff of professionals and technicians

+12 years of ground station operations

2009 — NOW
Córdoba Ground Station Operation

2018 — NOW
Tierra Del Fuego Ground Station Operation and Maintenance

MILESTONES.

ACCESS TO SPACE

TRONADOR 1B

2008

CUVS30

2009

TRONADOR 4000

2011

SAC D / AQUARIUS
completed mission

VEx 1A

VEx 1B

2014

VEx 5A

2017

2018

SAOCOM 1A
in orbit

2020

SAOCOM 1B
in orbit

TRONADOR II
satellite launcher

ONGOING PROJECTS

SABIAMAR
ongoing mission

SATELLITE MISSIONS

OUR LOCATIONS.

CÓRDOBA – TEÓFILO TABANERA SPACE CENTER

- Operation Center for Satellite Missions
- Operation of Córdoba Ground Station
- Engineering
- Metalworking fabrications
- Heat treatments
- Image processing

BAHÍA BLANCA – MANUEL BELGRANO SPACE CENTER

- Tronador Launch Base
- Engineering

TIERRA DEL FUEGO – TOLHUIN AUXILIARY FACILITY

- Ground Stations Operation

BUENOS AIRES CITY HEADQUARTERS

- General Management
- Engineering

LA PLATA – VILLA ELISA AUXILIARY FACILITY

- Electronic engineering specialized in RF
- Electronic laboratory

BUENOS AIRES – PUNTA INDIO SPACE CENTER AUXILIARY FACILITY

- Engineering
- Production of aerospace containers
- Metalworking fabrications
- Engine Testing

SATELLITE (📡) INFORMATION

A detailed illustration of a satellite in orbit above the Earth's atmosphere. The satellite is gold-colored with various instruments and a large antenna. The Earth's surface is visible below, showing land and oceans. A white signal icon (a circle with a dot and two curved lines) is overlaid on the satellite. The background is a dark space with a crescent moon and a planet on the right side.

SAOCOM® (Argentine Satellite of Observation with Microwaves) is a constellation made of two Earth observation satellites owned by CONAE® (National Commission for Space Activities).

VENG is the company designated by CONAE® to bring SAOCOM® products and services to the market, offering high availability satellite image services 100% focused on the needs of clients, accelerating the early adoption process for its incorporation into their business models.

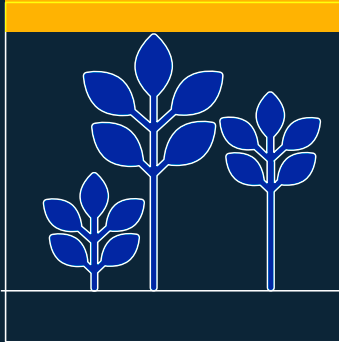
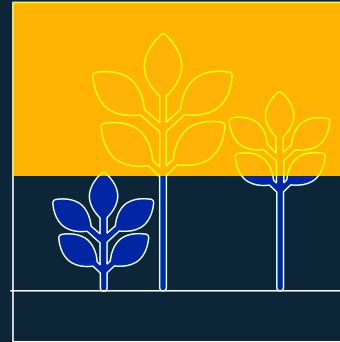
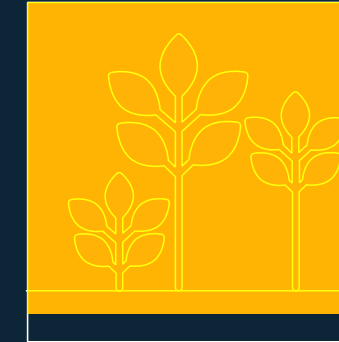

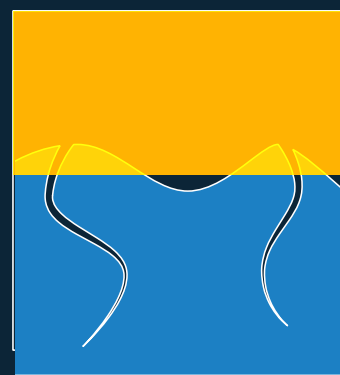
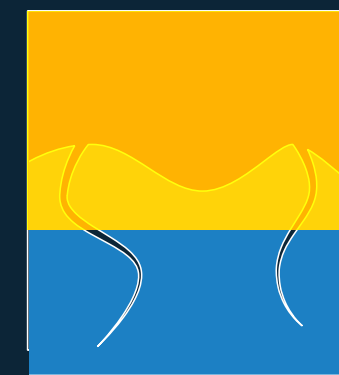

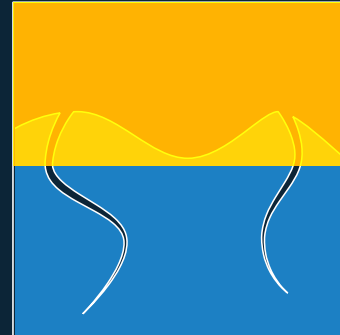
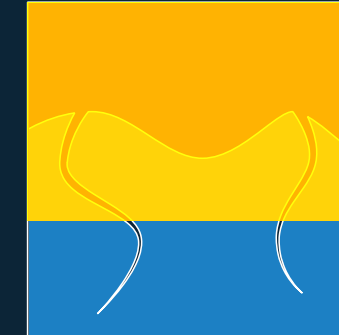
We develop customized solutions combining satellite information (SAR, InSAR, optical, etc.) for applications in various areas, such as agriculture, mining, oil & gas, environment, defense, etc.

L-BAND SAR TECHNOLOGY.

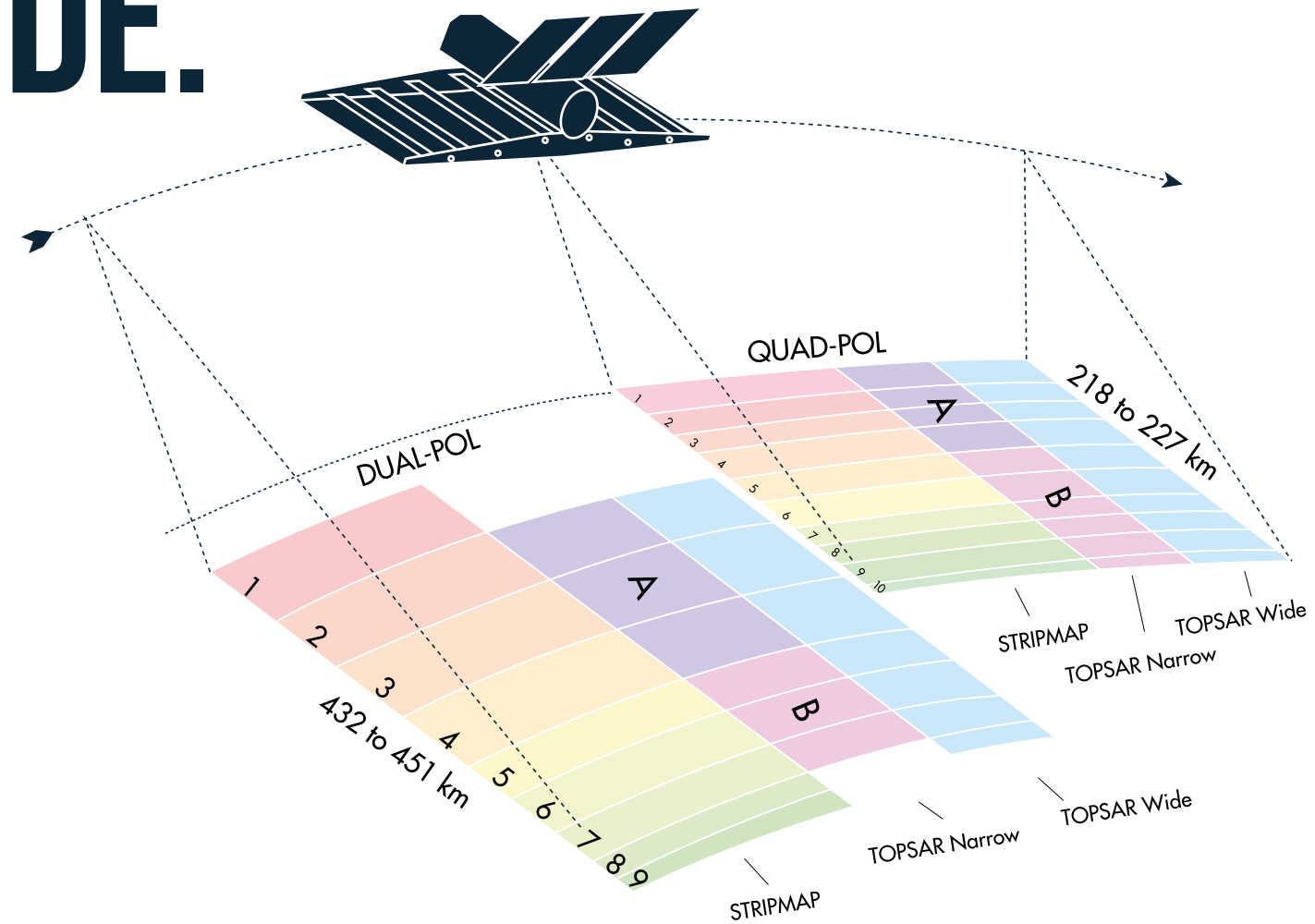
SAOCOM® is a constellation made of two quadruple polarization L-band SAR satellites which observe the Earth's surface night and day, regardless of weather conditions.

By working in L Band, the satellite can obtain information by penetrating the vegetation cover and soil, capturing moisture information. Other products it can generate include ship detection, soil moisture map, change detection for the Mining and Oil & Gas industries and the forecast system for wheat spike fusarium.

REVISIT TIME: 8 days (1A + 1B)
BEST RESOLUTION: 10 mts
QUAD POLARIZATION
STRIPMAP: 40 X 74 km ≈
TOPSTAR: 350 x 445 km ≈
ANGLE OF VIEW: From 20,7 to 50,2 deg

	X-Band	C-Band	L-Band
Wavelength	3 cm	6 cm	23 cm
VEGETATION			
DRY SNOW			
DRY SAND			

ACQUISITION MODE.



Acquisition Mode	Nominal Resolution (Rng x Az) [m]		Nominal Size of the Scene (Rng x Az) [km]	Polarizations
	Product L1A	Products L1B, L1C y L1D		
STRIPMAP SP	10 x 5	10 x 10	40 x 74	HH o VV
STRIPMAP DP	10 x 5	10 x 10	40 x 74	HH+HV o VV+VH
STRIPMAP QP	10 x 6	10 x 10	20 x 74	HH+HV+VH+VV
TOPSAR Narrow SP	10 x 30	30 x 30	150 x 222	HH o VV
TOPSAR Narrow DP	10 x 30	30 x 30	150 x 222	HH+HV o VV+VH
TOPSAR Narrow QP	10 x 50	50 x 50	100 x 222	HH+HV+VH+VV
TOPSAR Wide SP	10 x 50	50 x 50	350 x 445	HH o VV
TOPSAR Wide DP	10 x 50	50 x 50	350 x 445	HH+HV o VV+VH
TOPSAR Wide QP	10 x 100	100 x 100	220 x 445	HH+HV+VH+VV

SP: Single Polarization, DP: Dual Polarization, QP: Quad Polarization

PRODUCTS & SERVICES

L1 Scenes



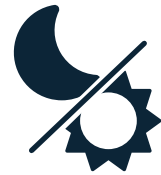
L1A, L1B, L1C & L1D SAR SCENES



CO-REGISTERED STACKS FOR INTERFEROMETRY



NEAR REAL TIME DELIVERY (5 – 7 HOURS)



DELIVERY 24X7



MONITORING SERVICE



PROGRAMMING ONLY

Products

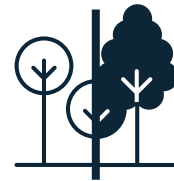


DEVELOPMENT OF TAILOR-MADE SOLUTIONS



SOIL MOISTURE MAPS

Services



CHANGE DETECTION SERVICE



INTERFEROMETRIC STUDIES

INDUSTRIES.

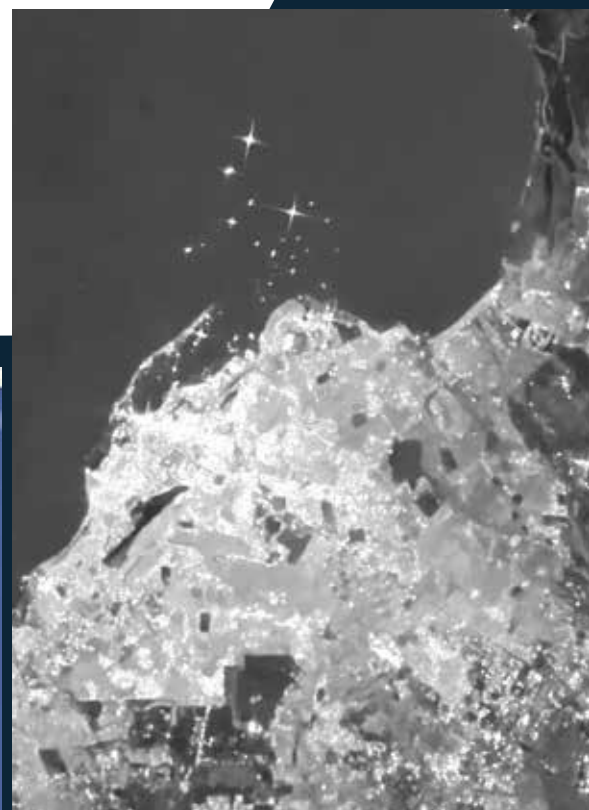
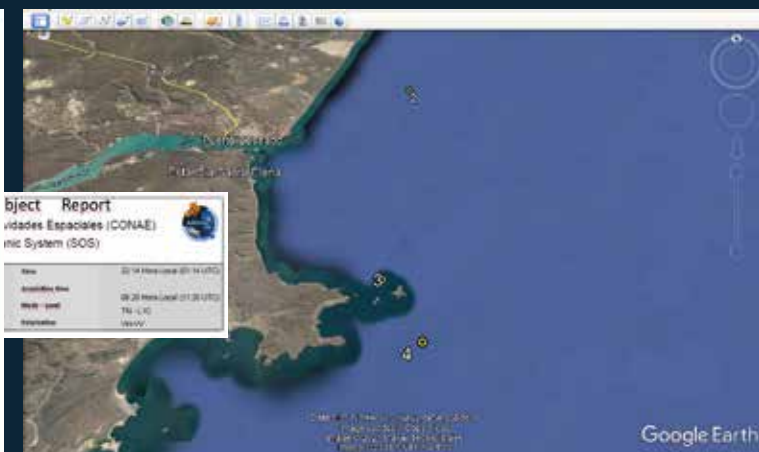
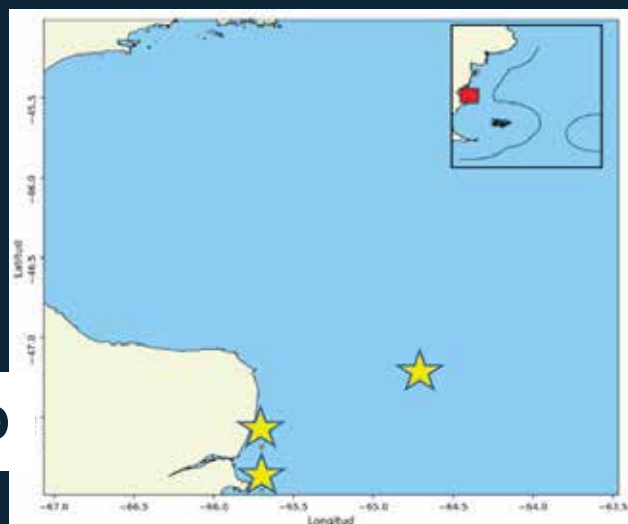
AREA	Near Real Time Delivery (5 – 7 hours)	Monitoring Service	Ship Detection	Oil Spills	Soil Moisture Maps	Interferometric Studies	Change Detection Service	Development of Taylor-Made Solutions
OIL & GAS	★		★	★		★	★	★
MINING		★				★	★	★
AGRICULTURE					★			★
INFRASTRUCTURE		★				★	★	★
ENVIRONMENT								★
FORESTRY		★				★	★	★
DAMS						★	★	★
INSURANCE							★	★
GOVERNMENT	★	★	★	★		★	★	★

RAPID MONITORING OPTION

SHIP DETECTION.

- **Delivery time:** 5 hours after Acquisition
- **Frequency of acquisition:** 2 products per day
- **Delivery Method:** FTP + email
- **Satellite inputs:** SAOCOM1A & SAOCOM1B

SATELLITE INFORMATION



RAPID MONITORING OPTION

OIL SPILL DETECTION.

- **Delivery time:** 8 hours after Acquisition
- **Maximum Frequency of acquisition:** 2 products per day
- **Delivery Method:** FTP + email
- **Satellite inputs:** SAOCOM1A & SAOCOM1B



RAPID MONITORING SERVICE OPTION.

- The Rapid Monitoring service provides the possibility of activating desired acquisition windows.
- The active term of each window is 5 days, it can be requested 24 hours (or before) prior to the first desired acquisition, and with a maximum of 12 acquisitions per window.
- This service has a fixed monthly fee, which includes 1 (one) activation window.
- If the client wishes to activate more windows in the same period, it can be requested.

MORE APPLICATIONS.

- Mining Oil & Gas Monitoring
- Drinkable Water Urban Leakage Detection
- Flood & Drought Monitoring
- Agricultural Data Monitoring

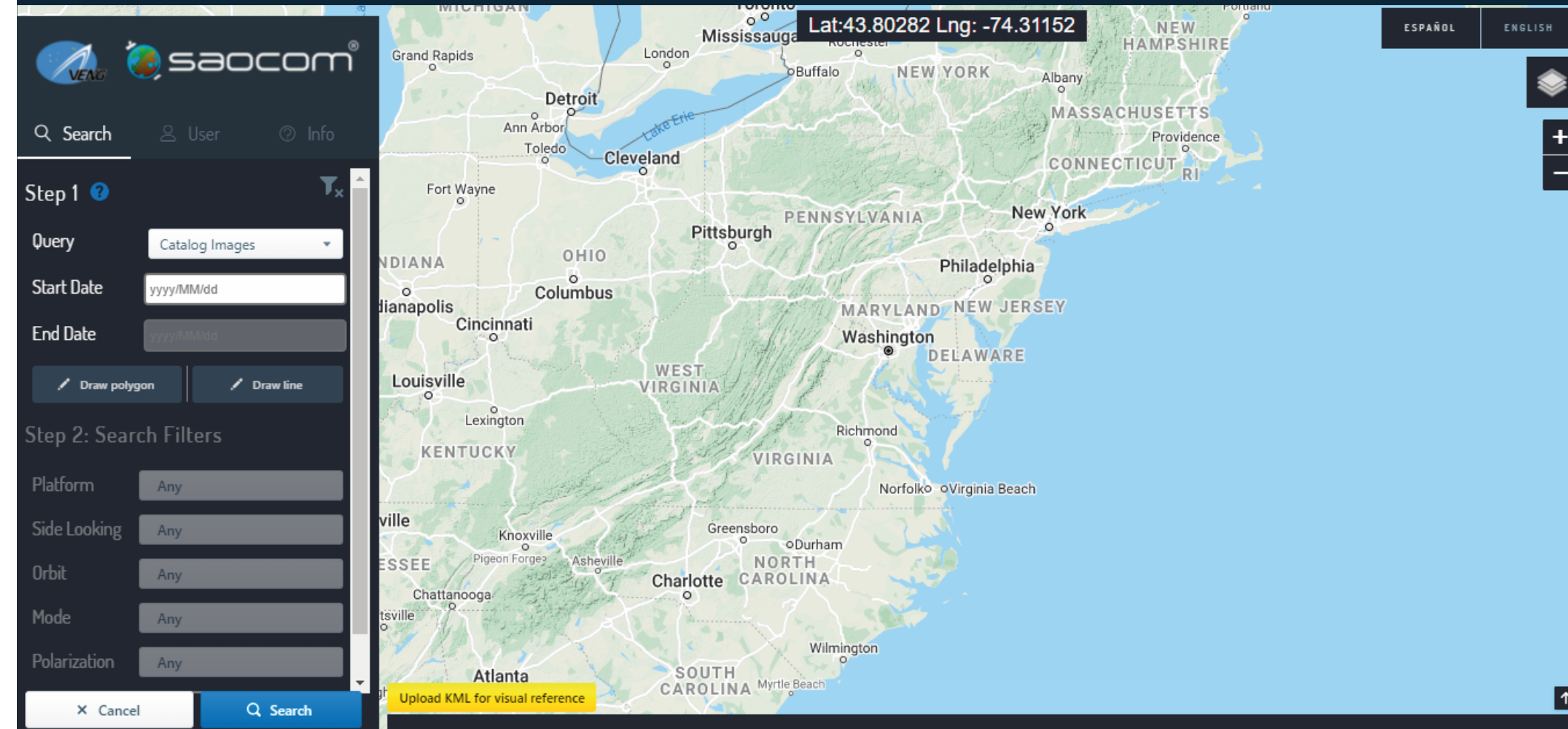


CUSTOMER ORIENTED OFFICE.

2
calendar days
in advance of acquisition date & time
Assuming confirmed order reception

24
hours from sensing
to get a new acquisition

24
hours from order reception
confirmation to deliver catalog requests



SAOCOM.COM.AR



EASY-TO-USE



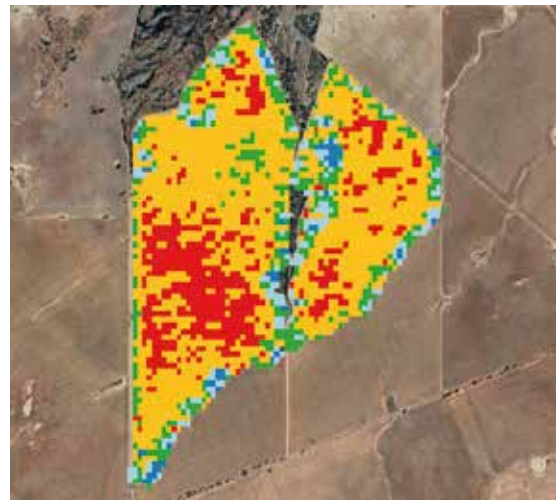
CATALOG IMAGES



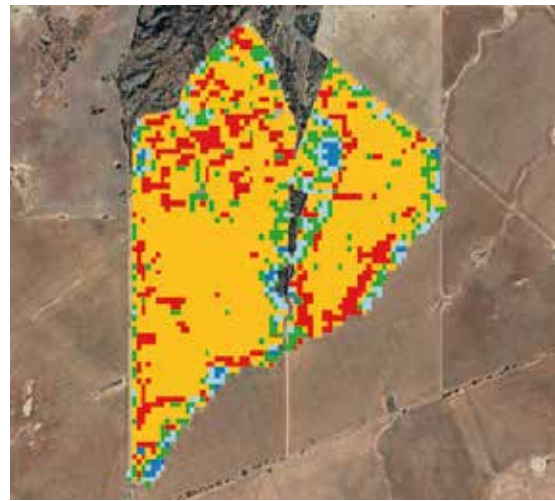
FUTURE IMAGES

USE CASES - AGRICULTURE

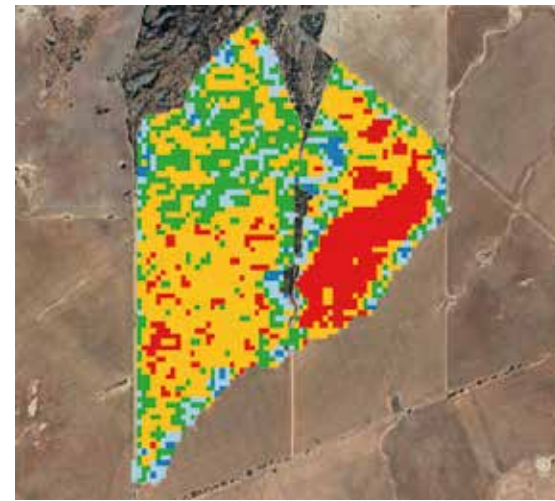
SOIL MOISTURE AMBIENT MAP



DATE: 30/6/2021
22:39:36



DATE: 16/7/2021
22:39:36



DATE: 1/8/2021
22:39:35



APPLICATION: AGRICULTURE

Soil moisture is a critical parameter for deciding the seeding date, for verifying the natural and artificial irrigation performance. Its useful as a source of data for crop analysis too.

DESCRIPTION

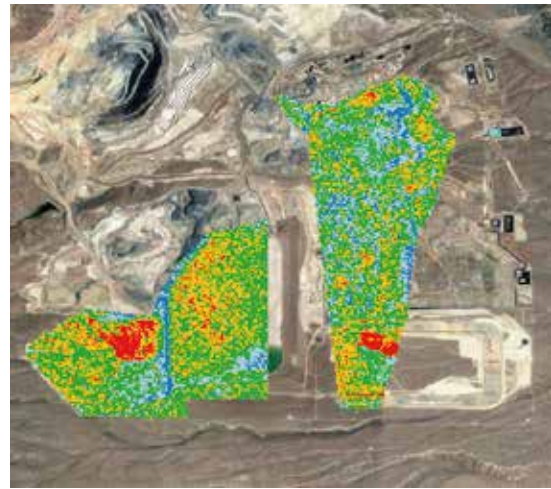
The image shows a sequence in a dedicated crop field for three dates sixteen days apart on each date.

SPECIFICATION

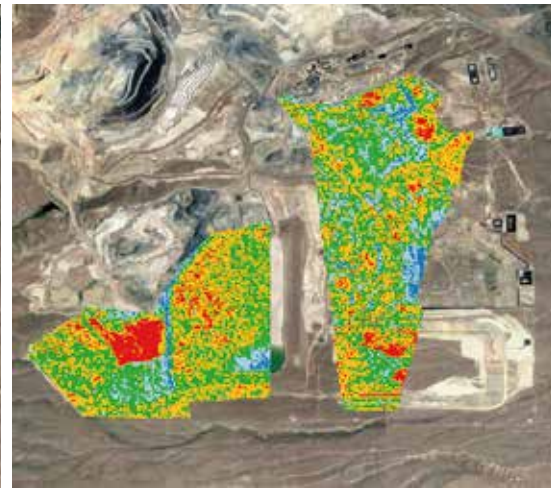
- Humidity ranges: 5-10, 10-20, 20-30, 30-40, 40-45 %vol/vol
- Spatial resolution: 30 meters
- Temporal resolution: 8 days
- Measurement on soil with known crop.
- Product based exclusively on SAOCOM data
- Customer calibration required

USE CASES - MINING

HEAP LEACHING:^{*} RELATIVE SOIL MOISTURE AMBIENT MAP



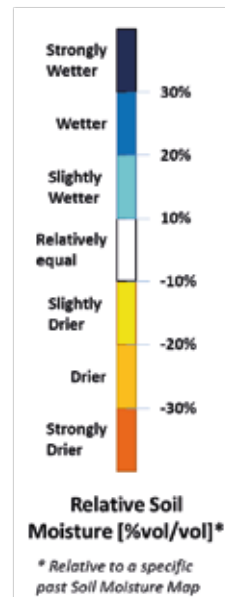
REFERENCE SCENE
DATE: 16/05/2022



RELATIVE SCENE
DATE: 24/05/2022



RELATIVE MAP (REFERENCE - RELATIVE)
DATE: 16/05/2022



*Gold, silver, etc.

APPLICATIONS

Heap leaching process in mining (especially gold and silver): Allows to gather information about evapotranspiration of fluids in the heap leaching process in order to fine tune the independent flows. This product enables the comparison between weeks, months and seasons of the year.

DESCRIPTION

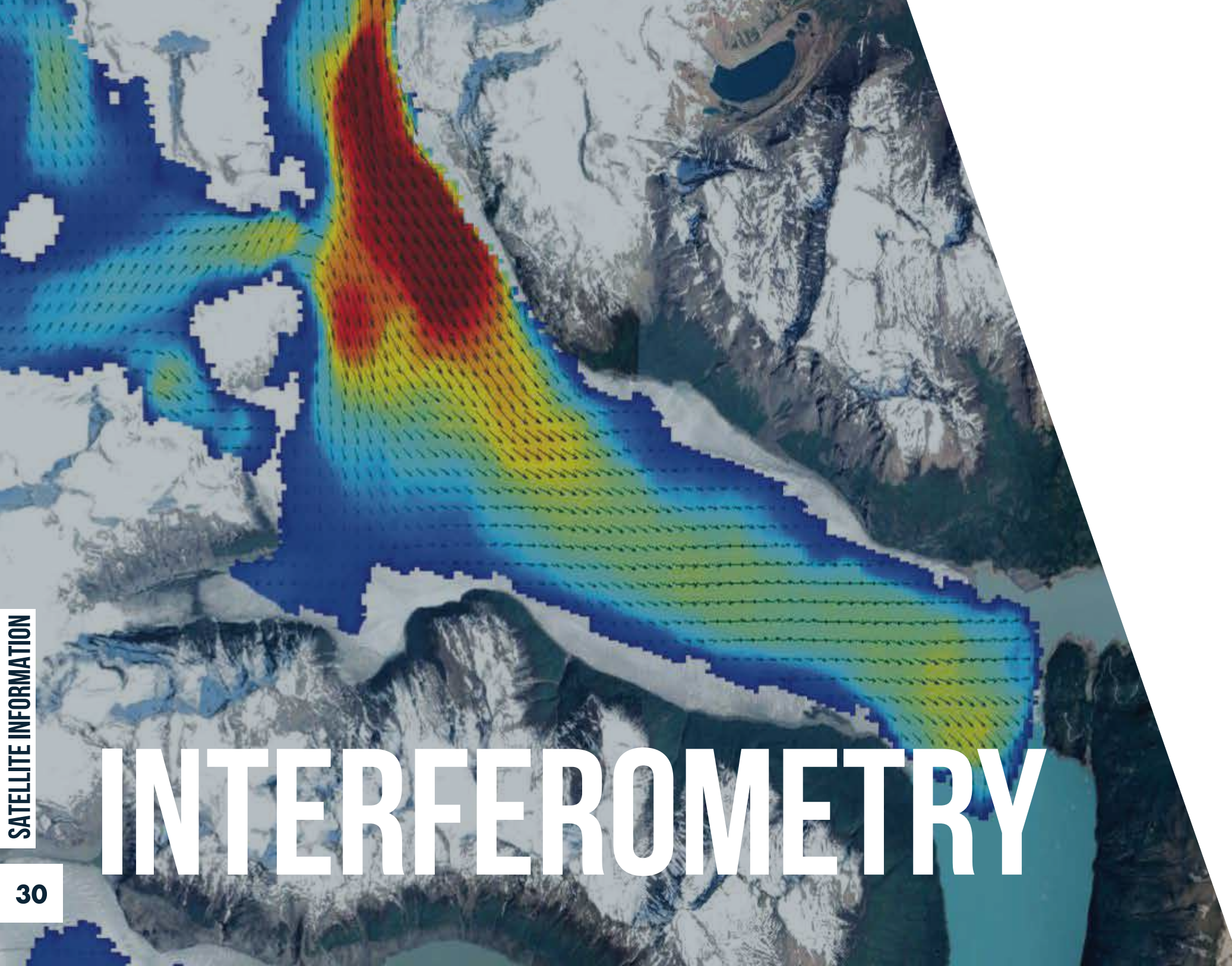
In the sequence of scenes is observed from left to right first the product serves to compare pixel by pixel the change observed. In second instance the scene to be compared with the reference is observed. Finally the result of subtracting the environment maps pixel by pixel showing the variation from one scene to another.

SPECIFICATION

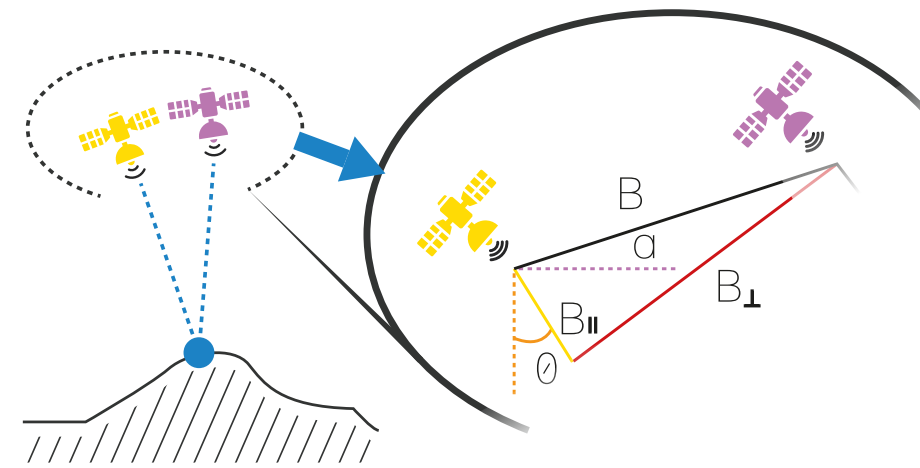
- Humidity ranges: strongly wetter, wetter, slightly wetter, equal, slightly dryer, dryer and strongly dryer
- Spatial resolution: 8 meters
- Temporal resolution: 8 days
- Measurement on bare soil
- Product based on SAOCOM data
- In-situ calibration is required to obtain absolute data.



INTERFEROMETRY



Interferometry is a technique that, based on two or more GROUND satellite images from two or more SAR satellite, makes it possible to obtain ground displacement measurements with high.



PRODUCTS & SERVICES.

Quantification and qualification service of ground displacement for monitoring and the consequent early warning. The study is carried out within a certain period of time and the differential interferometry technique is used for this purpose.



DIGITAL ELEVATION MODEL (DEM)

Oil&Gas uses

- Prospecting and Exploration
- Watershed Modeling
- Infrastructure projects
- Water and geological risk identification



GROUND DISPLACEMENT VELOCITY

Oil&Gas uses

- Monitoring of basin exploitation by Fracking
- Pipeline health monitoring due to subsidence or crumbling
- Infrastructure monitoring

USE CASES - OIL&GAS

PIPELINE MONITORING



Pipelines, used to transport oil, gas, and water, are works of great linear extension that reach thousands of kilometers. Along this path, they pass through different type of soils such as sand, mud, clay or different types of sedimentary, metamorphic or igneous rocks. In addition to that, changes in aquifers and reservoirs produce movements on ground over which pipelines are laid down. Differential interferometry (DInSAR) allows monitoring at centimetric and sub-centimetric levels with a temporal periodicity of

8 days in the case of the SAOCOM satellites. Thus, it is possible to identify areas where changes in the ground may represent a risk of pipeline damage.

USE CASES - OIL&GAS

OIL&GAS BASIN MONITORING



Fluid injection/extraction operations generate volumetric variations in the basins and, therefore, changes in the height of the surface cover. These changes can be difficult to measure due to the large surface area of the basins in which the operations take place. However, differential interferometric techniques (DInSAR) makes possible to measure surface height variations with centimetre and sub-centimetre precision. In this way, it is possible to estimate volumetric changes in the basin and associate them with fluid

extraction and injection processes. These data are of interest to monitor the infrastructure of the operations in order to prevent higher structural damages and to contrast injection/extraction values with volume changes in the basin to lower environmental risks. By means of the SAOCOM constellation, it is possible to carry out these studies with a periodicity of 8 days.

USE CASES - MINING

SLOPE STABILITY MONITORING



Mining activities are related to several anthropic and geophysical phenomena which tend to modify ground stability, such as changes in rocks due to the mining activity itself, heavy vehicles traffic, tensions of the faults and slopes wash in tailings dams, among others. All of these, lead to the necessity of ongoing monitoring to set early warnings in order to prevent possible accidents which may be a risk for people, environment and mining operation. Nevertheless, high-precision measurements

over time, result expensive and, in some cases, logistically difficult to obtain. However, differential interferometry (DInSAR) is an excellent alternative which allows to measure ground displacement with centimetric and sub-centimetric precision at intervals multiple of 8 days in the case of the SAOCOM satellite constellation.

USE CASES - INFRASTRUCTURE

SUBSIDENCE IN CIVIL WORKS ANALYSIS



High-rise buildings, bridges, tunnels, dams, routes, among others, are construction works that are settled on the ground. Extraction of fluids or solids in sub ground layers produces settlements which eventually lead to changes in upper layers of the land cover where the aforementioned construction works are located. Therefore, even foreseeing all the construction factors, it is necessary to analyze sudden or high-value changes to safeguard infrastructure avoiding both human and economic losses. In this sense,

the displacement measured by interferometric techniques achieves centimetric and sub-centimetric precision over large remotely observed areas. Measurements that, in the case of the SAOCOM satellites are possible at intervals multiple of 8 days. Therefore, by means of SAR measurements and the differential interferometry technique, it can be performed a continuous temporary analysis of ground movements and works that settle on it. Thus, it is possible to anticipate potential risks of damage to the structures.



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