CAP related activities at GSA: EGNSS and the geo-tagged photo applications
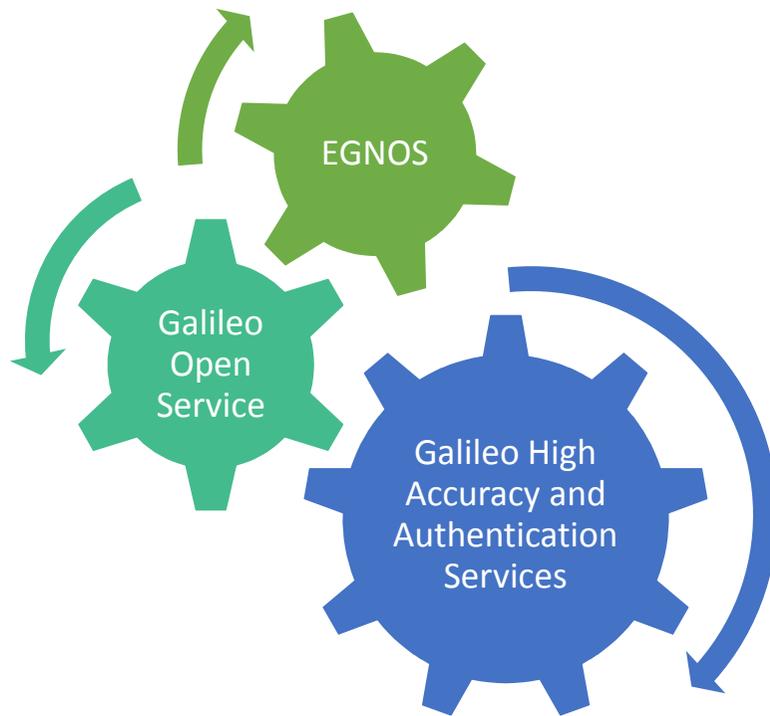
JRC workshop on checks and management of agricultural land in IACS

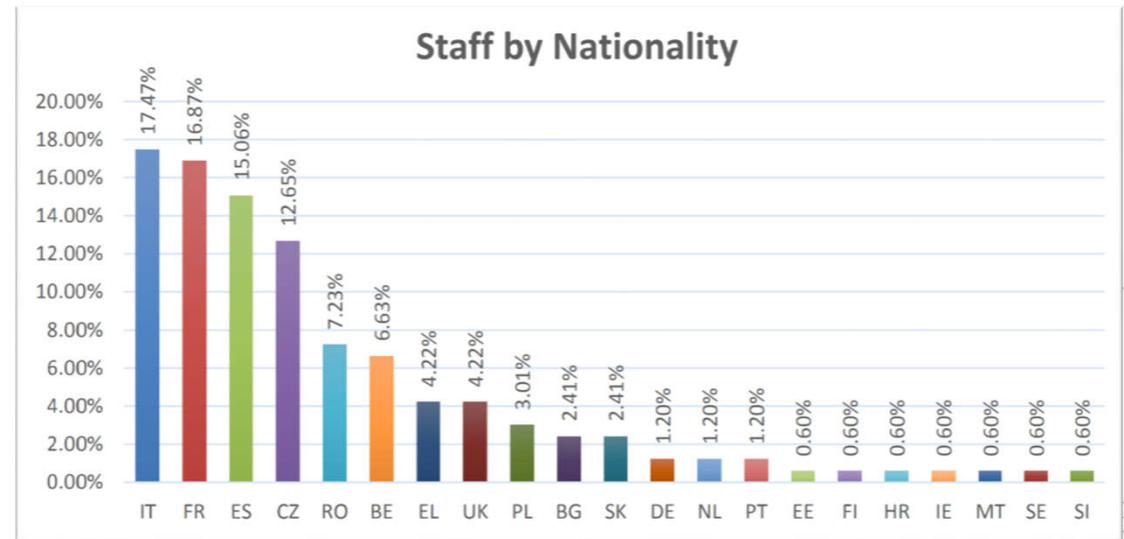**Joaquín REYES GONZÁLEZ**

April 11th 2019, Valladolid (Spain)

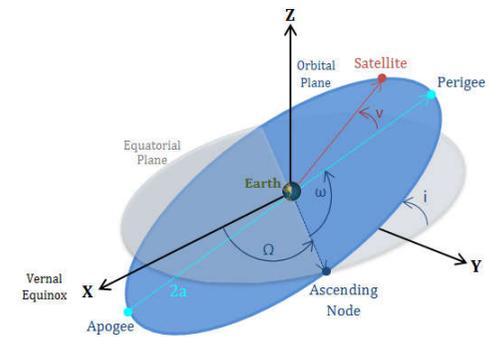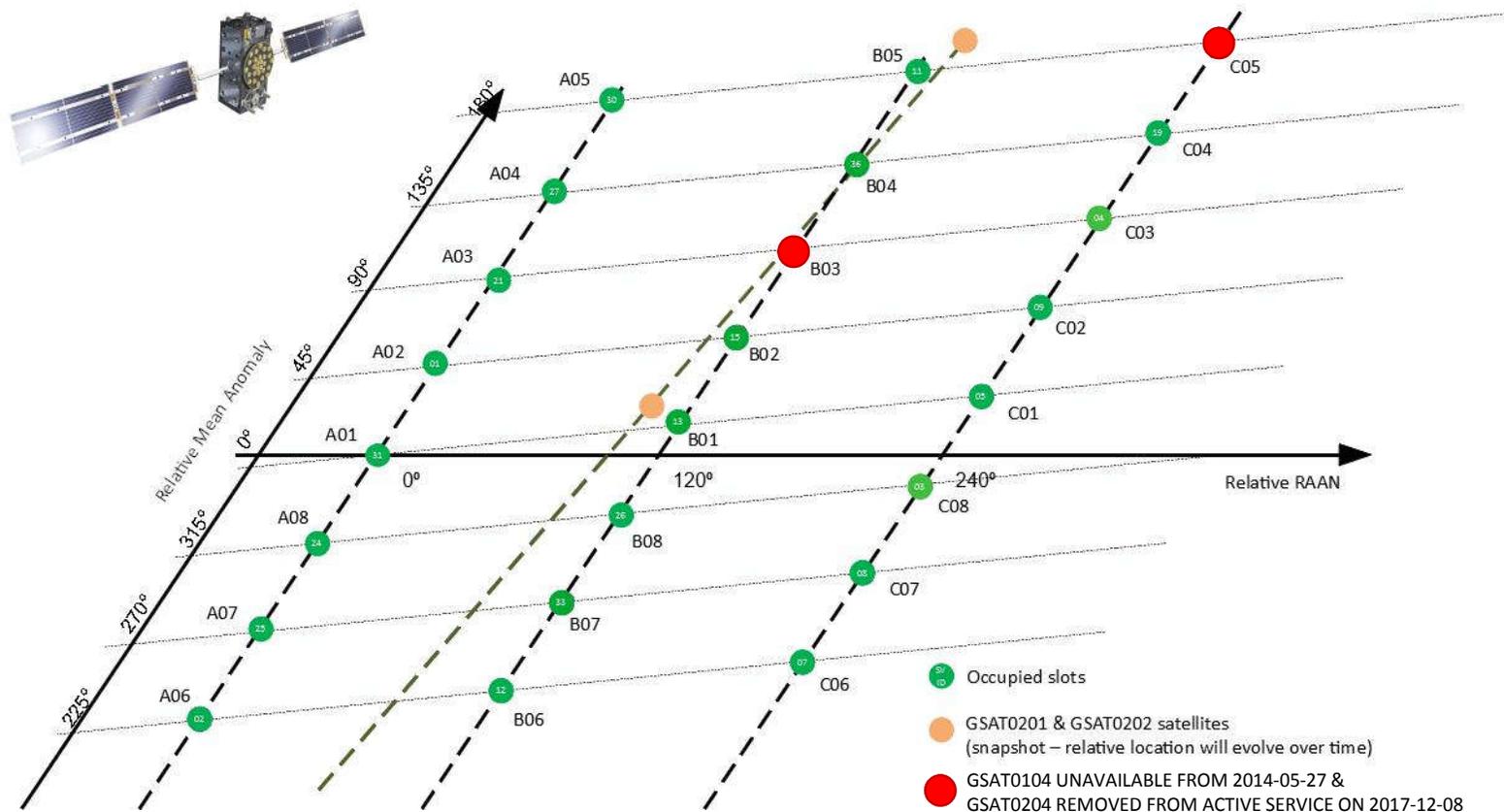# Relevant European services are available for agriculture

GSA is headquarter in Prague with Galileo subsidiaries across Europe

Staff by Nationality

Source: SPD 2018

Find more information at www.gsa.europa.eu

GSA reports the Galileo Constellation status at the GNSS Service Centre

Find more available information at
www.gsc-europa.eu

- ● Occupied slots
- ● GSAT0201 & GSAT0202 satellites
  (snapshot – relative location will evolve over time)
- ● GSAT0104 UNAVAILABLE FROM 2014-05-27 &
  GSAT0204 REMOVED FROM ACTIVE SERVICE ON 2017-12-08

4

High-precision solutions delivered through mass market devices

Android 7+ access to raw GNSS measurements

Over 125 smartphones models **Galileo** enabled

GSA GNSS Raw Measurement Task Force

Dual frequency mass market receivers

World's **first two dual-frequency GNSS smartphones** hits the market

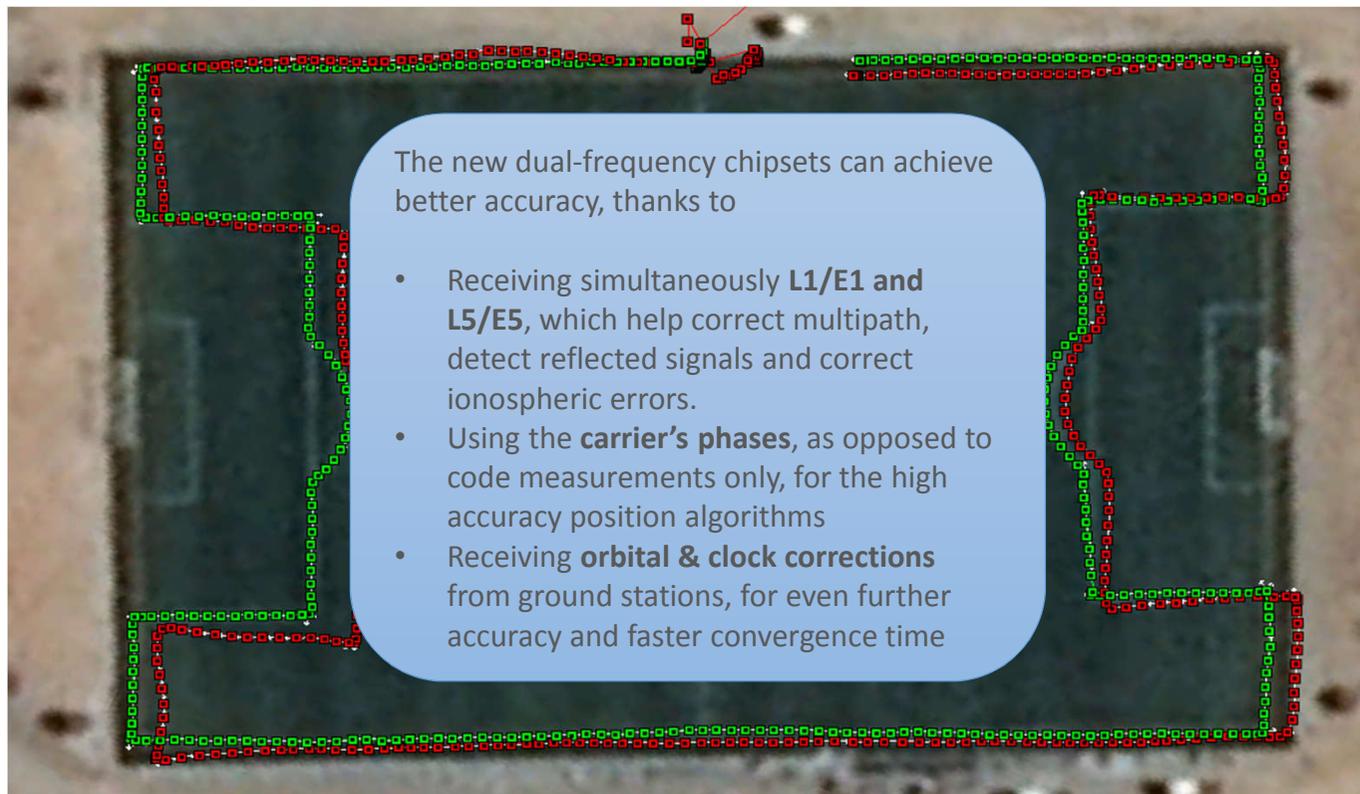**Democratisation of mapping and affordable augmentation services**

High-precision positioning entering the mass market

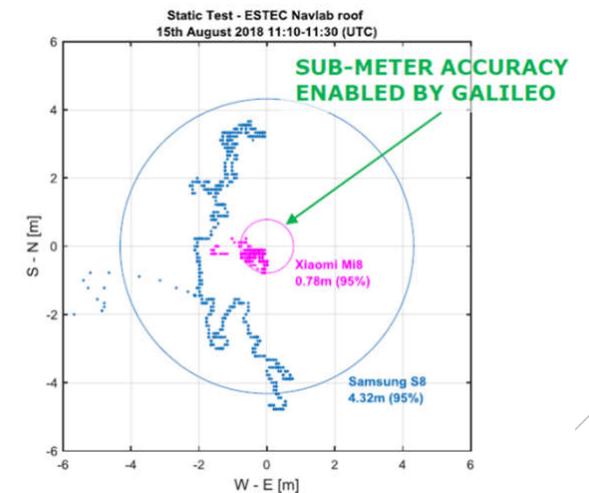# Dual frequency brings better positioning performance

- Red: BCM4774 (L1)
- **Green: BCM4775 (L1+L5) – dual frequency**

The new dual-frequency chipsets can achieve better accuracy, thanks to

- Receiving simultaneously **L1/E1 and L5/E5**, which help correct multipath, detect reflected signals and correct ionospheric errors.
- Using the **carrier's phases**, as opposed to code measurements only, for the high accuracy position algorithms
- Receiving **orbital & clock corrections** from ground stations, for even further accuracy and faster convergence time

Image Courtesy of Broadcom

Static Test - ESTEC Navlab roof
15th August 2018 11:10-11:30 (UTC)

SUB-METER ACCURACY
ENABLED BY GALILEO

Xiaomi Mi8
0.78m (95%)

Samsung S8
4.32m (95%)

Source: ESA

22 operational
Galileo sat (E1/E5)

12 operational GPS
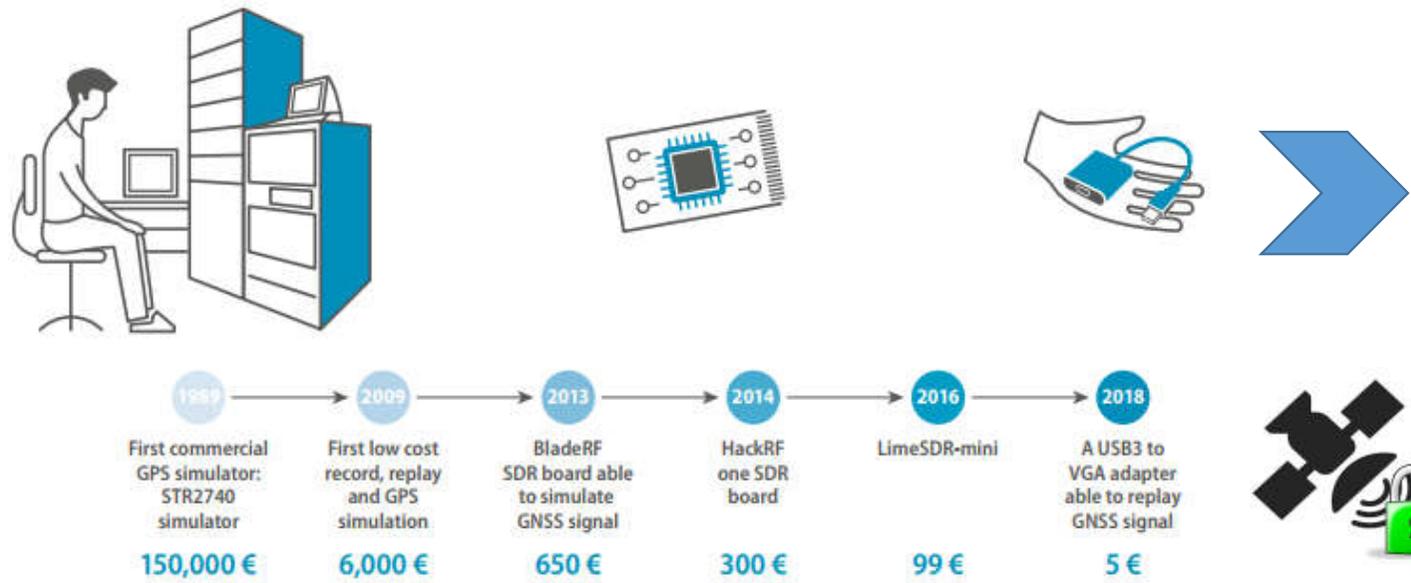**Block IIF sat (L1/L5)**

6

Spoofing, the emerging threats across all market segments

The importance of protecting against vulnerabilities was strongly highlighted during the User Consultation Platform (UCP) as a common theme of user demands across all market segments

GNSS SPOOFING CAPABLE DEVICES EVOLUTION COST

OS-NMA is the ability of the system to **confirm to the users** that they are **utilising navigation data**, which **comes from Galileo satellites** (and not from any other sources).

1969	2009	2013	2014	2016	2018
First commercial GPS simulator: STR2740 simulator	First low cost record, replay and GPS simulation	BladeRF SDR board able to simulate GNSS signal	HackRF one SDR board	LimeSDR-mini	A USB3 to VGA adapter able to replay GNSS signal
150,000 €	6,000 €	650 €	300 €	99 €	5 €

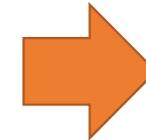# E-GNSS works in synergy with Copernicus at the centre of new CAP

Monitoring approach using Sentinel data

➕
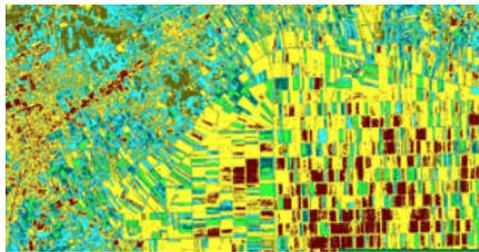
E-GNSS based tools and applications

➡️

Smartphone based Geo-tagged Photos

Galileo brings **unique features** to achieve both **higher accuracy** (dual-frequency, upcoming high-accuracy services) and **robustness** (message authentication)

GSA is funding an Android APP (based in EGNSS) for geo-tagged photos

Objective

- Open Source **Android application** using GNSS raw measurements that can be integrated and customise for end-user solutions.
- To generate input for the Integrated Administrative Control System (IACS) of the Common Agricultural Policy (CAP).

Benefits

- All the EU paying agencies will benefit from smoother flow of information into their systems.
- To enable farmers around EU to digitalize many procedures reducing errors and duplication and improving efficiency.

Timeframe

- The outcome shall be available by Q4 2019, in line with the Galileo Open Service Navigation Message Authentication Signal in Space (OS-NMA SiS testing phase).

"USING GNSS RAW MEASUREMENT ON ANDROID DEVICES"

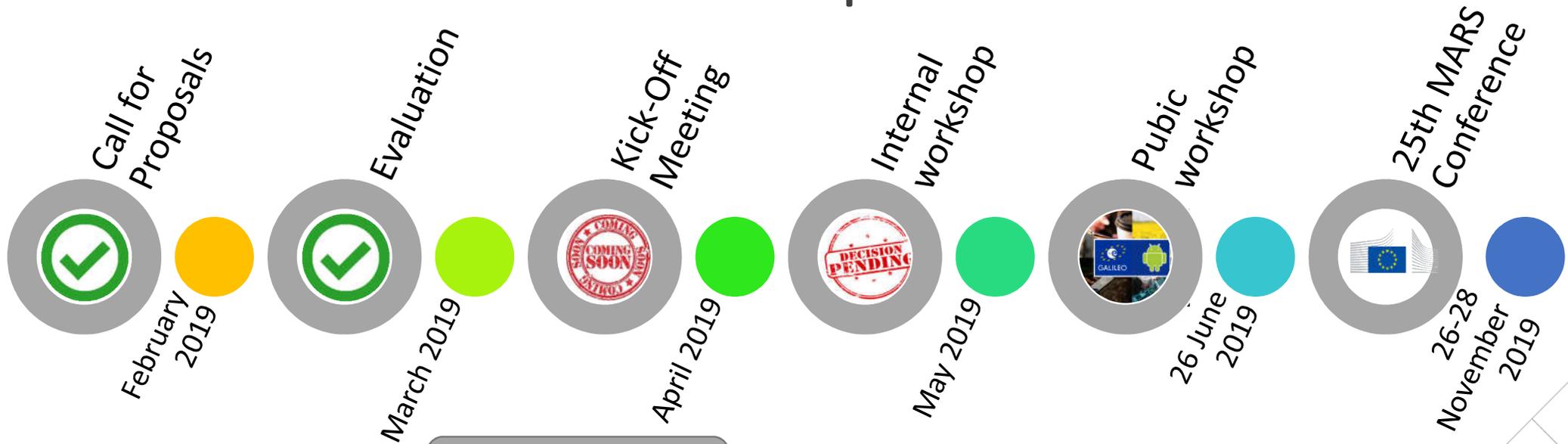# Find today a Galileo-enabled device to use all the advantages

Over 125 smartphone models are **Galileo** enabled

Galileo dual-frequency smartphones and upcoming high-accuracy services will allow **sub-meter accuracy and more robust positioning** which will **accelerate innovative solutions** in CAP and Digital Farming

ON THE ROAD

ON THE WATER

ON THE TRAIN

IN THE AIR

ON TIME

INTERNET OF THINGS

GOING MOBILE

ON THE FARM

ON THE MAP

DURING AN EMERGENCY

SPACE APPLICATIONS

www.usegalileo.eu

The timeline is already defined and you are welcome to follow-up!

Call for Proposals — February 2019

Evaluation — March 2019

Kick-Off Meeting — April 2019

Internal workshop — May 2019

Pubic workshop — 26 June 2019

25th MARS Conference — 26-28 November 2019

DISCOVER WHY PRAGUE is the ♥ OF NAVIGATION!

Save the dates and see you in Prague!

JOIN US

joaquin.reyes@gsa.europa.eu

Linking space to user needs

How to get in touch: www.GSA.europa.eu

EGNOS-portal.eu   GSC-europa.eu   UseGalileo.eu

The European GNSS Agency is hiring!

Apply today and help shape the
future of satellite navigation!