



# GATEMAN Workshop

## 8<sup>th</sup> SESAR Innovation Days

1. Project Description (GATEMAN)  
Alberto de la Fuente  
[GMV]

Salzburg 3<sup>rd</sup> December 2018



Founding Members



EUROPEAN UNION



EUROCONTROL

# Summary



1. **Funding**
2. Project Objectives
3. Organization
4. WP Description
5. Methodology
6. Communication and Dissemination

# 1. Funding



Call id	H2020-SESAR-2016-2
Topic	<p>SESAR-ER3-05-2016</p> <p>Enabling Aviation Infrastructure: CNS</p> <p><b>Scope.</b> <i>Projects are expected to propose ideas for combining existing on-board and ground equipment for enhancing CNS capabilities. Solution for integrated CNS solutions and the implications of having one technology performing the three services at the same time can be studied (single point of failure..).</i></p>
Funding scheme	RIA (Research and Innovation Actions)
Grant Agreement No.	783183
Project	GATEMAN
Start date	01/01/2018
End date	31/12/2019

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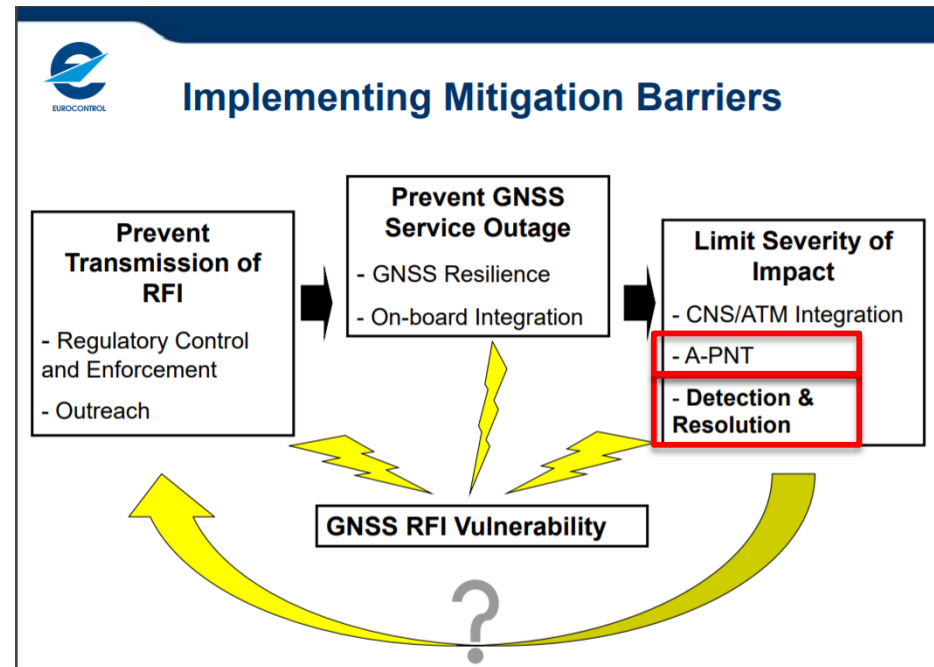
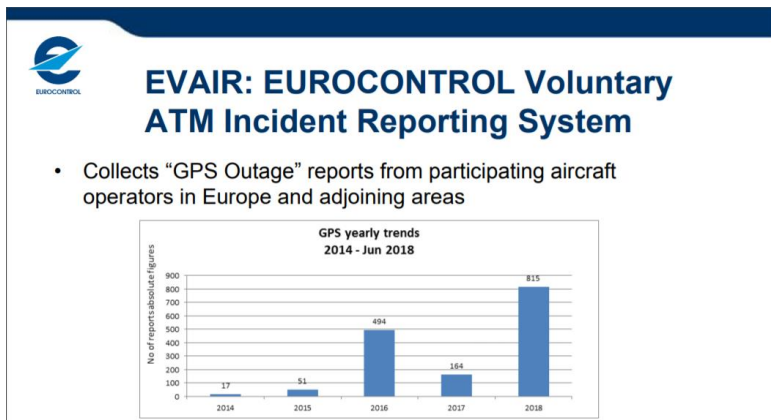
## 2. Project Objectives

### Context (RFI GNSS in aviation)

GNSS RFI Mitigation: International Efforts to Protect Aviation

David Duchet & Gerhard BERZ / EUROCONTROL NAV & CNS Unit

58th Civil GPS Service Interface Committee Meeting / Miami, 24 September 2018



## 2. Project Objectives



### Mitigation Barrier (MB1)

Novel concept for integrated GNSS RFI air navigation threats management.

- a. Detection and localization of jamming
- b. Detection and localization of spoofing.
- c. Detection and localization based on existing aircraft equipment (minimizing cost of retrofit and forward-fit).
- d. MC/MF (i.e. GPS L1/Gal E1 and GPS L5/Gal E5a).

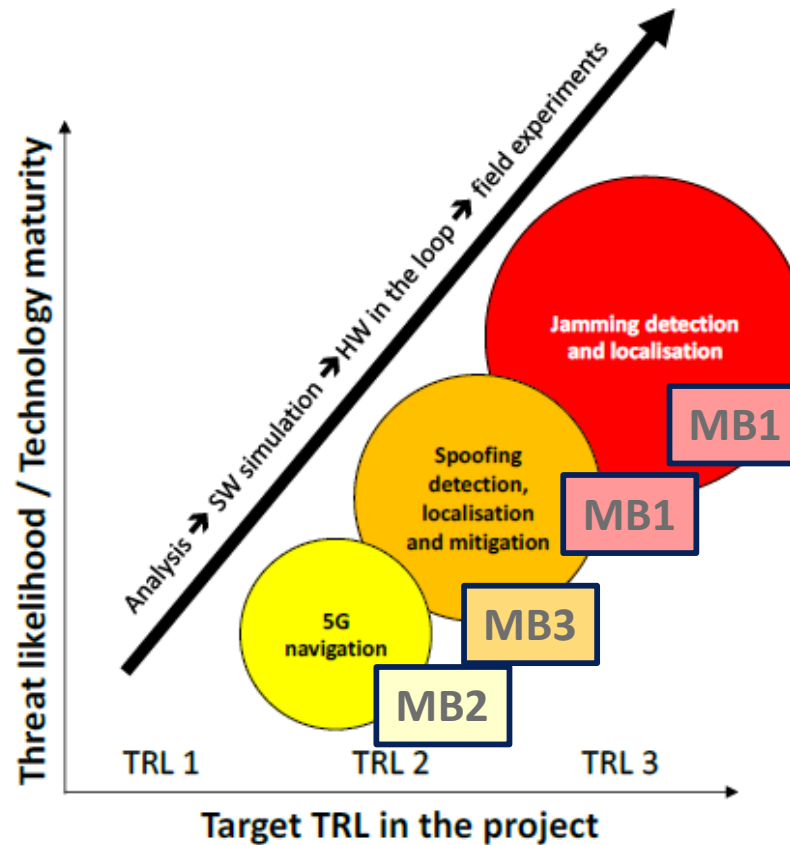
### Mitigation Barrier (MB2)

Application of 5G ground cell stations networks as A-PNT technology.

### Mitigation Barrier (MB3)

Application of “spoofing monitoring” to mitigate the effects of spoofing.

## 2. Project Objectives



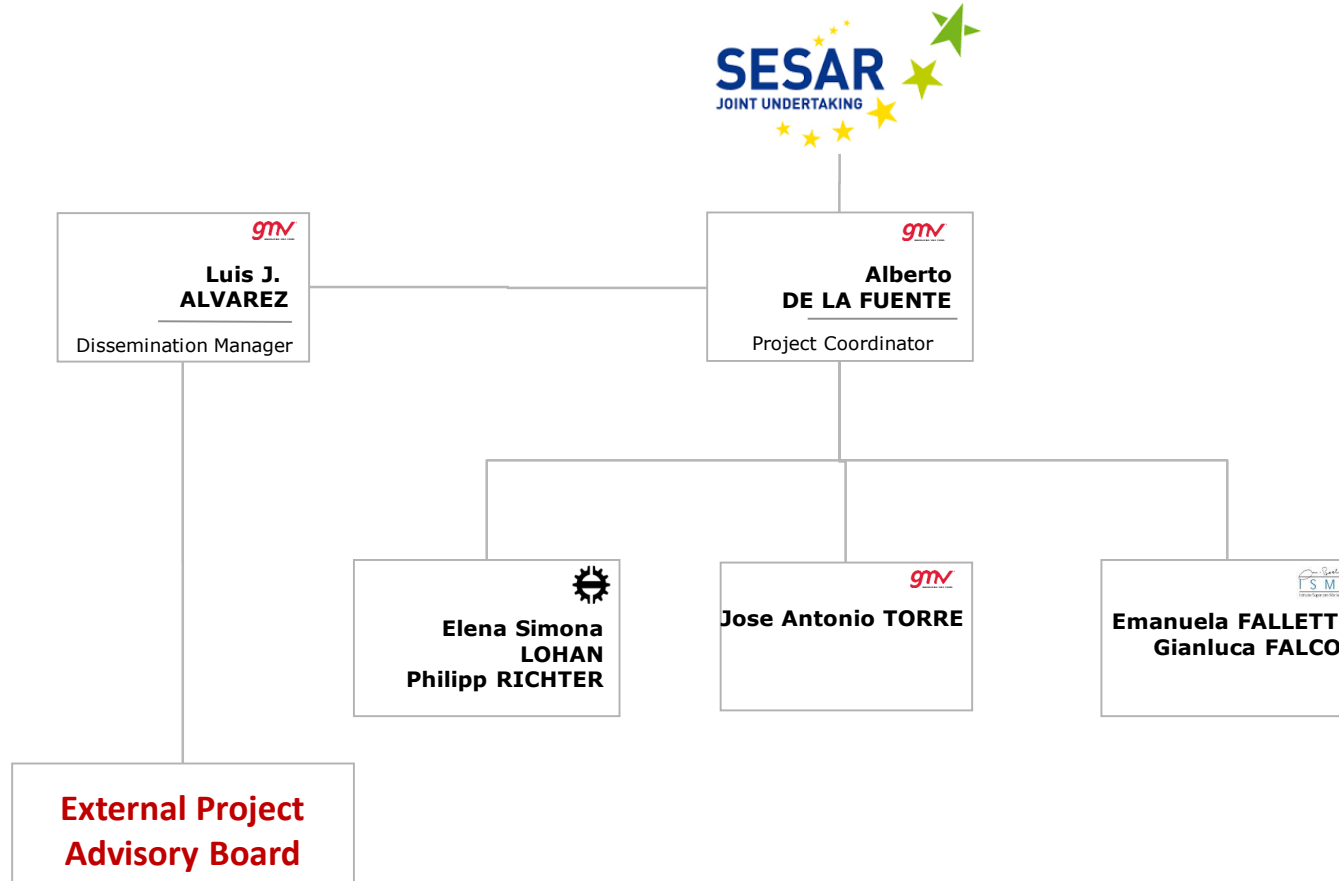
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# 3. Organization



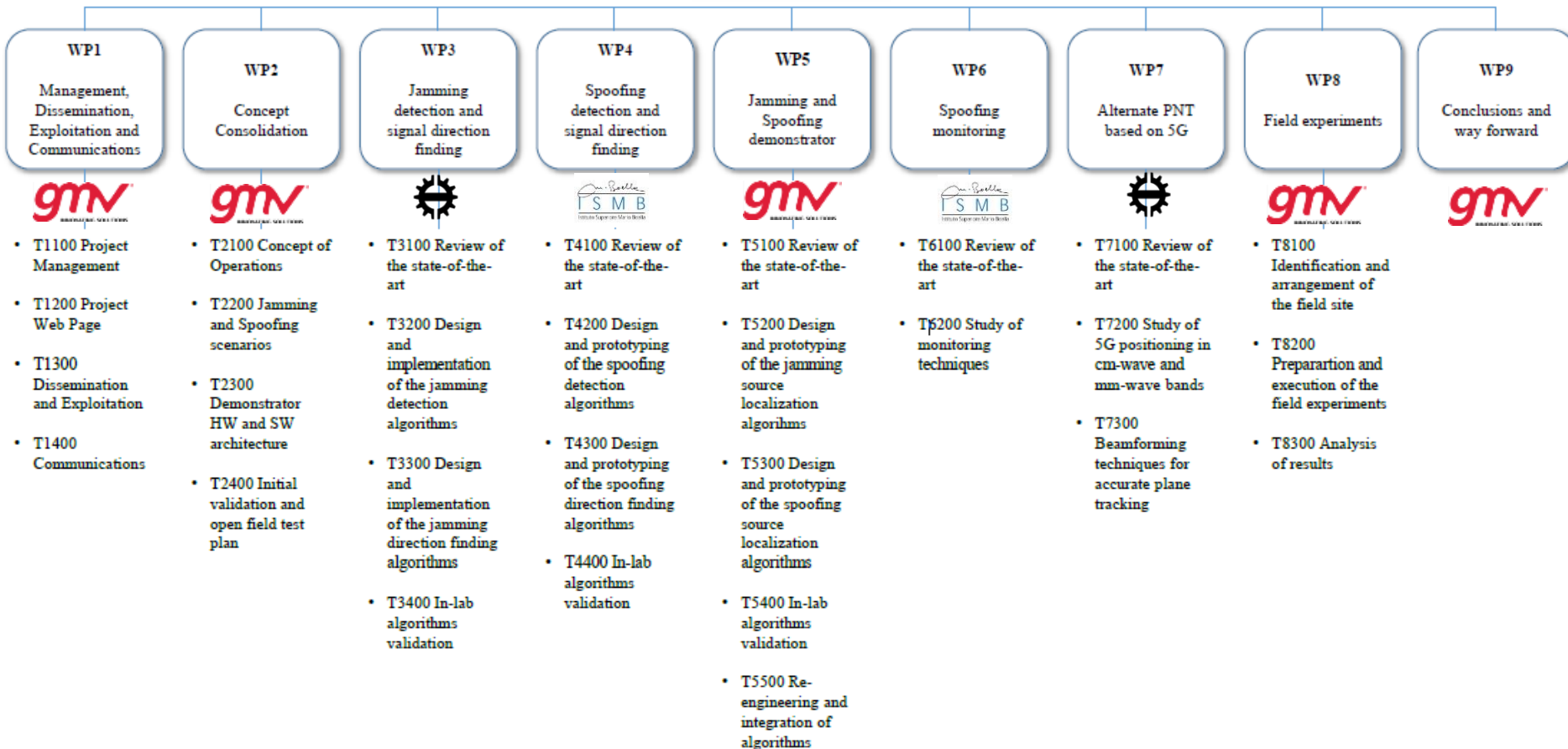
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# 4. WP Description

## GATEMAN



# 4. WP Description



## WP1. Management

### Objective

- To plan and manage the project, and plan and execute the disseminations, exploitation and communications actions.

## WP2. Concept Consolidation

### Objective

- To define the concept of integrated GNSS RFI air navigation threats management.

## WP3. Jamming detection and signal direction finding

### Objective

- Investigate algorithms for jamming detection, direction finding, and localization based on multi-antenna configuration at the aircraft.

## 4. WP Description



### WP4. Spoofing detection and signal direction finding

#### Objective

- Design and software prototyping of the algorithms for spoofing detection and signal direction finding based on multi-antenna configuration at the aircraft.

### WP5. Jamming and Spoofing Demonstrator

#### Objective

- Design and prototype an algorithm to estimate the location of a RFI source by 'aggregating' the localization parameters (direction of arrival) calculated at different locations of the aircraft.
- Integrate the jamming and spoofing algorithms with the selected hardware into one single platform.

# 4. WP Description



## WP6. Spoofing monitoring

### Objective

- Study of algorithms for spoofing monitoring

## WP7. Alternative PNT based on 5G

### Objective

- Investigate the suitability of 5G-based positioning solutions as backup navigation mean (an alternative to GNSS-based) in aviation, especially when taking off and landing.

## WP8. Field Experiments

### Objective

- Preparation and execution of an open-field test campaign.

## WP9. Conclusions

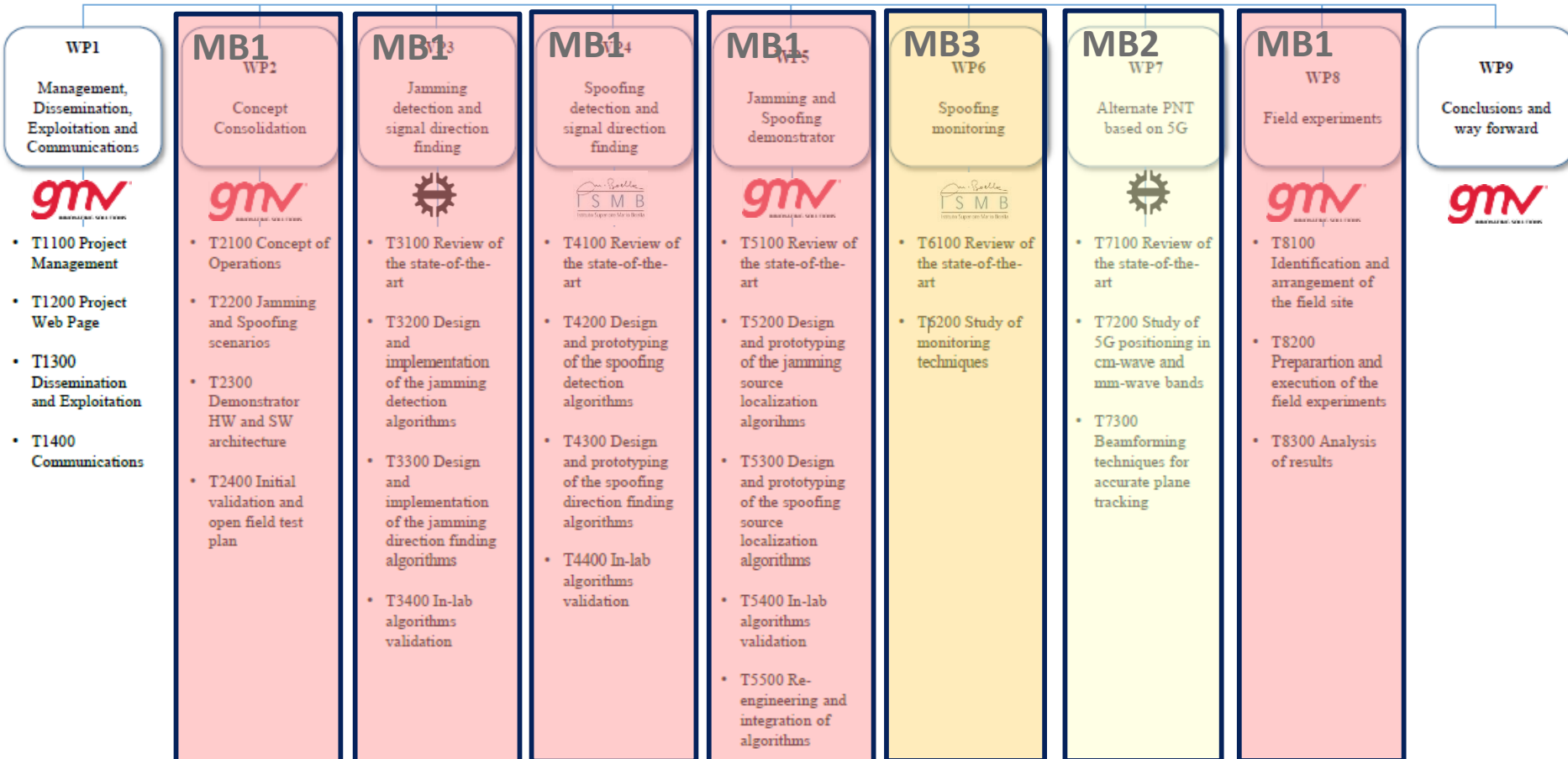
### Objective

- Prepare Final Report and close-out of the projects.

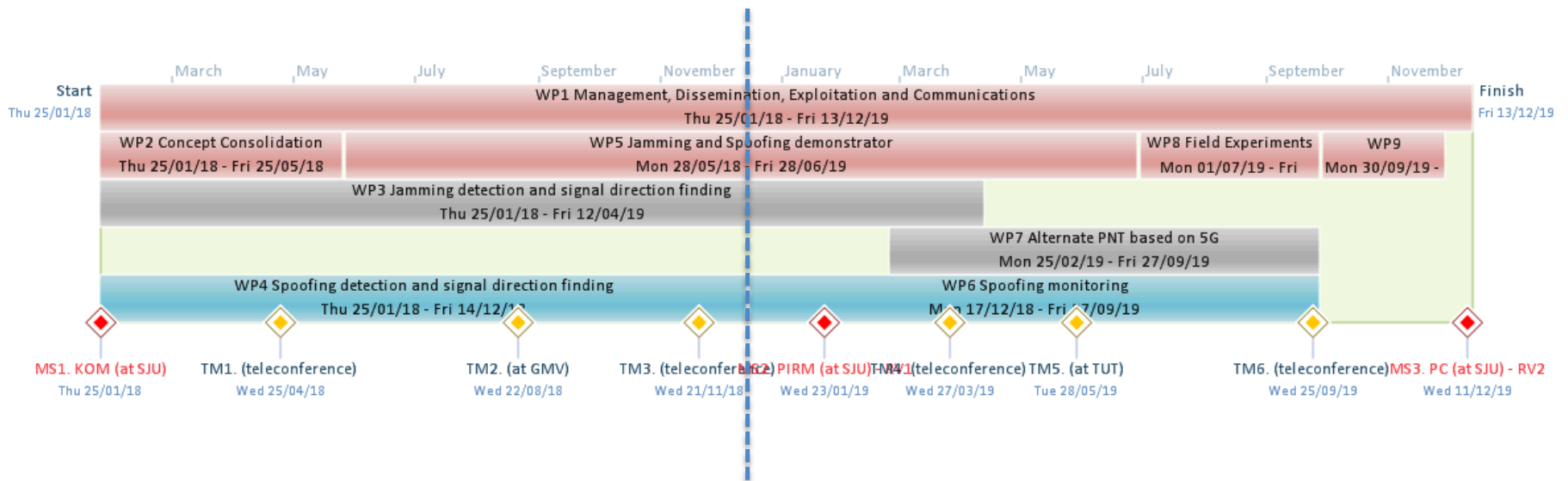
# 4. WP Description

## WPs vs Objectives (MB)

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# 4. WP Description





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# 5. Methodology

MB3

MB2

MB1

WP6 – Spoofing monitoring

WP7 – A-PNT (5G)

Concept Consolidation

WP2

Technology Feasibility Studies

Technology Proof of Concept

Conclusions and Way Forward

WP9

Algorithms Design and Prototyping

Algorithms SW-based Validation

Algorithms Validation with HW in the loop

Algorithms re-engineering to reach TRL3

Algorithms Validation by Field Experiments

WP3 - Jamming

WP3 - Spoofing

WP8 – Field Experiments

WP5 - Demonstrator

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# 6. Communication and Dissemination



Deliverables (Dissemination Level: Public)

Papers / Presentation / Workshops ...

For latest info visit:

<http://gateman.gmv.com/>

Twitter: @GatemanH



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## Thank you very much for your attention!



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Founding Members



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