

Communication Material

Deliverable ID:	D8.2
Project Acronym:	SATERA
Grant:	101164313
Call:	HORIZON-SESAR-2023-DES-ER-02
Topic:	HORIZON-SESAR-2022-DES-ER-01-WA2-1
Consortium Coordinator:	UPV
Edition date:	13 December 2024
Edition:	01.00
Status:	Official
Classification:	[PU]

Abstract

This document contains the description of the communication materials available to all the SATERA partners for communication activities and SATERA visual identification.

Authoring & Approval

Author(s) of the document

Organisation name	Date
UNITOV	03/11/2024

Reviewed by

Organisation name	Date
UPV	12/12/2024
ENAIRE	12/12/2024
COLLINS	12/12/2024
UNITOV	12/12/2024
UNIV COIMBRA	12/12/2024
INPE	12/12/2024

Approved for submission to the SESAR 3 JU by¹

Organisation name	Date
UPV	17/12/2024
ENAIRE	17/12/2024
COLLINS	13/12/2024
UNITOV	13/12/2024
UNIV COIMBRA	19/12/2024
INPE	19/12/2024

Rejected by²

Organisation name	Date
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¹ Representatives of all the beneficiaries involved in the project

² Representatives of the beneficiaries involved in the project.

Document History

Edition	Date	Status	Company Author	Justification
00.01	03/11/2024	Draft	UNITOV	First draft
00.02	12/12/2024	Draft	UNITOV	Second draft
01.00	13/12/2024	Final version	UNITOV	Final Version

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SATERA

SPACE-BASED COMPOSITE ADS-B AND MULTILATERATION SYSTEM
VALIDATION THROUGH SCALABLE SIMULATIONS

SATERA

This document is part of a project that has received funding from the SESAR 3 Joint Undertaking under grant agreement No.101164313 under European Union's Horizon Europe research and innovation programme.



Table of Contents

Abstract	1
1 Introduction.....	7
1.1 Applicable reference material	7
2 Visual identity.....	8
2.1 Logos.....	8
2.2 Banners.....	9
2.3 QR Codes.....	10
2.4 Poster Templates.....	12
2.5 Rollup Templates.....	13
2.6 Presentation Template	14
2.7 Report Templates	15
2.8 Flyers Templates.....	17
2.9 Newsletter Template	20
2.10 Stickers	20
3 Website	24
4 Press releases	29
5 Flyers.....	30
6 Roll-ups	31
7 Social media	34
7.1 LinkedIn	34
7.2 X	36
7.3 YouTube.....	38
8 Videos.....	39
9 List of acronyms	41

List of Figures

Figure 1: Project logo.....	8
Figure 2: Project logo (white).....	9
Figure 3: SESAR 3 Joint Undertaking logo (left), European emblem and funding statement (right) ..	9
Figure 4 Web Header	9
Figure 5 Web Footer	10
Figure 6 Printed materials Header.....	10
Figure 7 Consortium Footer	10
Figure 8 Disclaimer Footer	10
Figure 9 Website direct link QRcode (left), Newsletter direct link QRcode (right).....	11
Figure 10 YouTube direct link QRcode(left), LinkedIn direct link QRcode(right).....	11
Figure 11 X direct link QRcode	11
Figure 12 Poster 70cm x 50 cm Template.....	12
Figure 13 Roll-up Template	13
Figure 14 Example of a SATERA presentation slide, Title.....	14
Figure 15 Example of a presentation slide, Consortium.....	15
Figure 16 SATERA Word Template.....	16
Figure 17 Example of a SATERA document	17
Figure 18 SATERA Flyer template (Dark), A4	18
Figure 19 SATERA Flyer Template, A4.....	19
Figure 20 Newsletter Template	20
Figure 21 SATERA Logo Stickers (big).....	21
Figure 22 SESAR 3 JU and EU Logos Stickers (big).....	22
Figure 23 all-logos Stickers (small)	23
Figure 24 Website -Homepage	25
Figure 25 Website – About page	26
Figure 26 Website – Consortium page	27

Figure 27 Website – Newsletter page	28
Figure 28 SATERA Flyer for general event (First version)	30
Figure 29 SATERA Roll-up (version A)	32
Figure 30 SATERA Roll-up (version B)	33
Figure 31 SATERA account on LinkedIn.....	35
Figure 32 SATERA account on LinkedIn, example of posts	36
Figure 33 SATERA account on X.....	37
Figure 34 SATERA account on YouTube	38
Figure 35 SATERA Teaser Highlights	40

List of Tables

Table 1: SATERA preliminary website structure	24
Table 2: SATERA videos	39
Table 3: List of acronyms	41

1 Introduction

1.1 Applicable reference material

- [1] SESAR 3 Joint Undertaking Multiannual Work Programme 2022-2031
- [2] Grant Agreement N° 101164313 — SATERA — HORIZON-SESAR-2023-DES-ER-02
- [3] SESAR 3 Joint Undertaking Visual Identity Charter, November 2022
- [4] Guidance Social media guide for EU funded R&I projects
- [5] Project's teaser videos guidelines
- [6] EU emblem and guidance on its use
- [7] Communication-at-a-glance guidelines
- [8] SESAR 3 Project Handbook
- [9] SESAR 3 Joint Undertaking Communication Guidelines
- [10] SATERA Initial CDE

2 Visual identity

The visual identity is the first key aspect for a clear, attractive, coherent, and effective communication structure. The SATERA visual identity will be shaped, following the SESAR 3 JU Visual Charter [3] which specifically aims to:

1. Build brand recognition and thereby brand value
2. Improve the efficiency of both internal and external communications
3. Produce a professional and consistent visual identity across all media

Digital promotional materials, such as flyers, brochures, and posters, are and will be developed along all the project to provide an overview of the project, highlight each partner's role within various work packages, and outline the project's main goals and potential impact on scientific and commercial development across the European Union exploiting the building blocks provided in these sections.

These materials are shared with partners to support their efforts in presenting and promoting the SATERA project and its outcomes.

Printed versions will be produced on an as-needed basis for specific activities, with a focus on minimizing print quantities to ensure sustainability.

In the following sub-sections, the communication materials useful to build a clear visual identity are reported.

2.1 Logos

The SATERA logo (in Figure 1) has been designed by the SESAR 3 JU Communications office, following the SESAR 3 JU Visual Charter, which provides the key elements for the logo branding, including the font (Titillium regular) and the colour deep blue (HEX 00306F) identified for Exploratory Research projects.. A secondary white logo in white is also available (Figure 2). Both, the SATERA logos are available to all the partners in the internal repository and on STELLAR platform.



Figure 1: Project logo



Figure 2: Project logo (white)

Moreover, to ensure consistent communication and build brand recognition, SATERA will use the SESAR 3 JU logo (Figure 3, left) and the European Union logo (Figure 3, right) in all communication materials promoting its project activities [7][9].

The communication and dissemination activities will always indicate that they reflect only the author's view, and that the SESAR 3 JU is not responsible for any use that may be made of the information it contains.

When displayed together with another logo, the SESAR 3 JU logo and the EU emblem will have appropriate prominence [6].



Figure 3: SESAR 3 Joint Undertaking logo (left), European emblem and funding statement (right)

All the logos are available to all the partners in the internal repository, in the visual identity folders.

2.2 Banners

Different banners with the visual identity of the project, to be used as header or footer in communication materials and websites, were developed and are reported in the following figures (Figure 4, Figure 5, Figure 6, Figure 7, and Figure 8).



Figure 4 Web Header



Figure 5 Web Footer

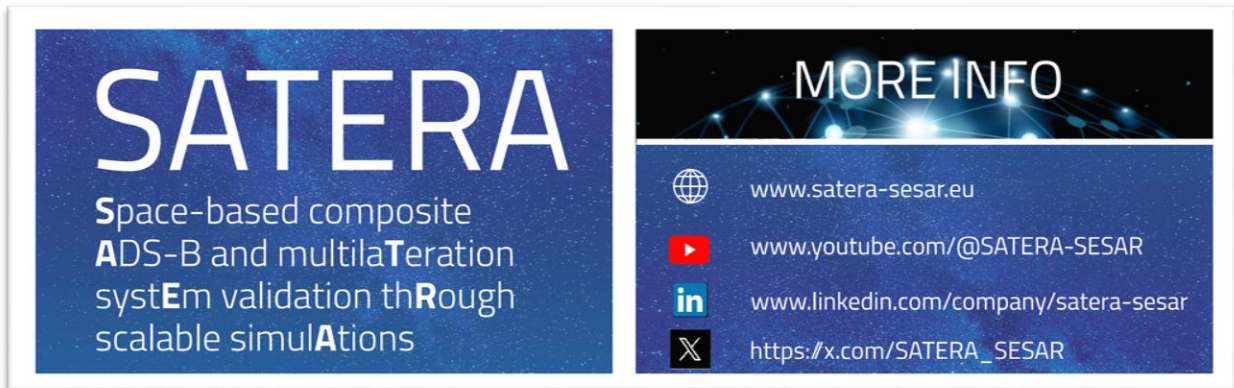


Figure 6 Printed materials Header

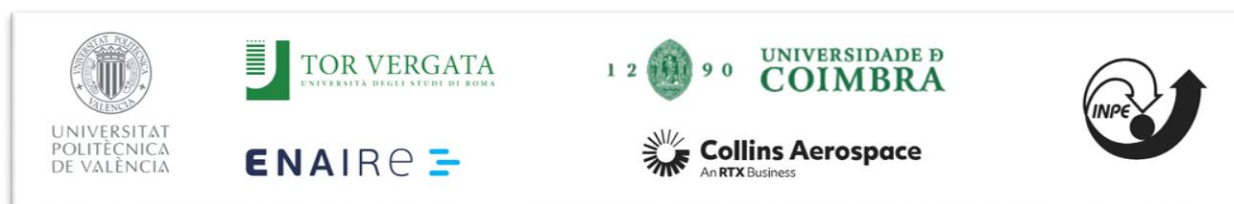


Figure 7 Consortium Footer



Figure 8 Disclaimer Footer

All the banners are available to all the partners in the internal repository, in the visual identity folder.

2.3 QR Codes

QR codes for direct access to the webpage, the Social-media and Newsletter were developed and are available to all the partners in the identity folder in the internal repository. All the QR codes are also reported in the following figures (Figure 9, Figure 10, and Figure 11).

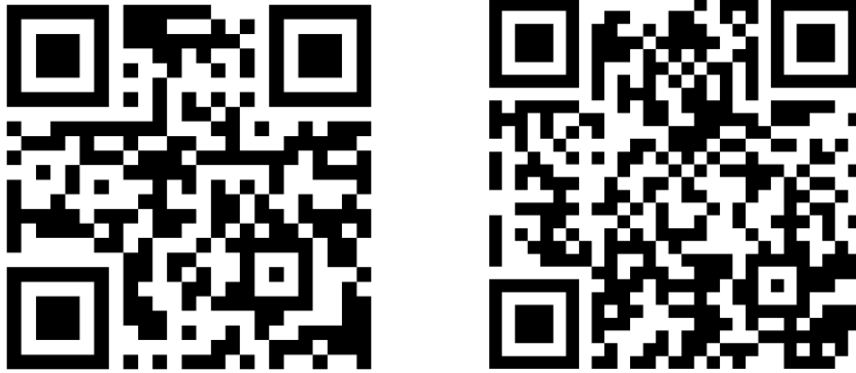


Figure 9 Website direct link QRcode (left), Newsletter direct link QRcode (right)

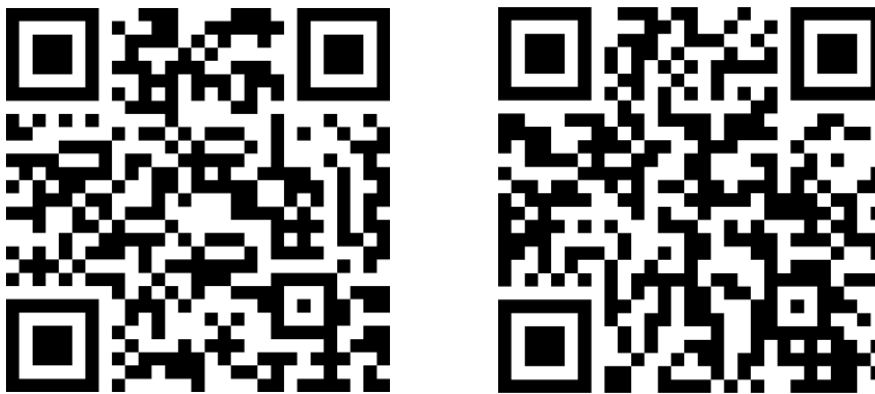


Figure 10 YouTube direct link QRcode(left), LinkedIn direct link QRcode(right)

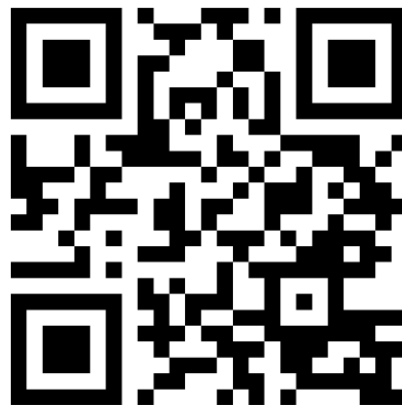


Figure 11 X direct link QRcode

All the QR codes are available to all the partners on the internal repository, in the communication materials folders.

2.4 Poster Templates

The following template was created for SATERA posters design and development (50X70 cm). It can be used, for example, in scientific conferences and fairs (Figure 12).



Figure 12 Poster 70cm x 50 cm Template

All the templates are available to all the partners on the internal repository, in the communication materials folders.

2.5 Rollup Templates

The following template was created for SATERA Roll-ups to be tailored and used in fairs, conferences, workshops (Figure 13).

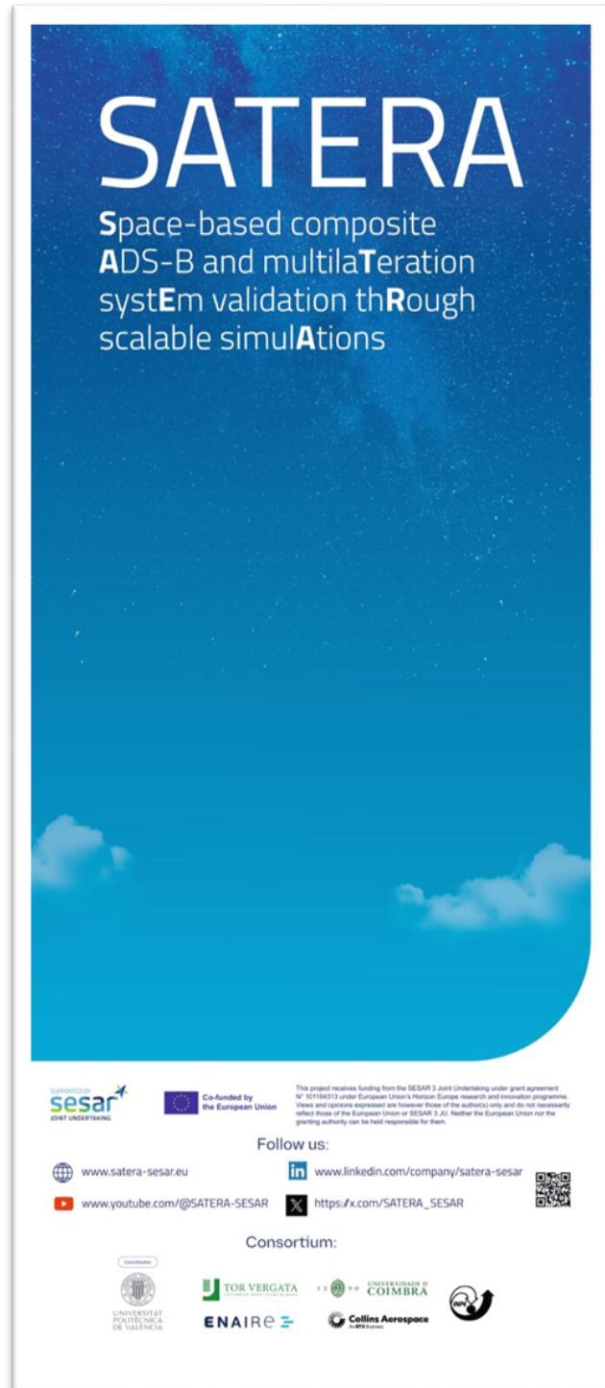


Figure 13 Roll-up Template

Roll-up template is available to all the partners on the internal repository, in the communication materials folders.

2.6 Presentation Template

The presentation template proposed by SESAR 3 JU will be used for the project presentations. The presentation is customized by adding the SATERA logo and disclaimers (when needed).

The template is available to all the partners in the internal repository, in the communication materials folders. Examples are reported in Figure 14 and Figure 15.



Figure 14 Example of a SATERA presentation slide, Title.



Figure 15 Example of a presentation slide, Consortium

2.7 Report Templates

Any SATERA documents will use the template proposed by SESAR 3 JU, customized with the project logo, and disclaimers when needed (Figure 16 shows the first two pages of the word template, and Figure 17 shows an example of a SATERA document/deliverable).



SATERA

SATERA Report Template

Deliverable ID: [DX.X]
Project Acronym: SATERA
Grant: 101164313
Call: HORIZON-SESAR-2023-DES-ER-02
Topic: HORIZON-SESAR-2022-DES-ER-01-WA2-1
Consortium Coordinator: UPV
Edition date: [Click or tap to enter a date]
Edition: [Edition Number]
Status: Official
Classification: [PU]

Abstract
 This document contains is the reference report template for any SATERA documents

Authoring & Approval

Author(s) of the document

Organisation name	Date
UNITOV	
UPV	

SATERA

sesar
JOINT UNDERTAKING

COLLINS 13/09/2024

Reviewed by

Organisation name	Date
UPV	
ENAIRE	
COLLINS	
UNITOV	
UNIV COIMBRA	
INPE	

Approved for submission to the SESAR 3 JU by¹

Organisation name	Date
UPV	
ENAIRE	
COLLINS	
UNITOV	
UNIV COIMBRA	
INPE	

Rejected by²

Organisation name	Date

Document History

Edition	Date	Status	Company Author	Justification
00.01				

¹ Representatives of all the beneficiaries involved in the project
² Representatives of the beneficiaries involved in the project.

Page | 2
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EUROPEAN PARTNERSHIP



Figure 16 SATERA Word Template

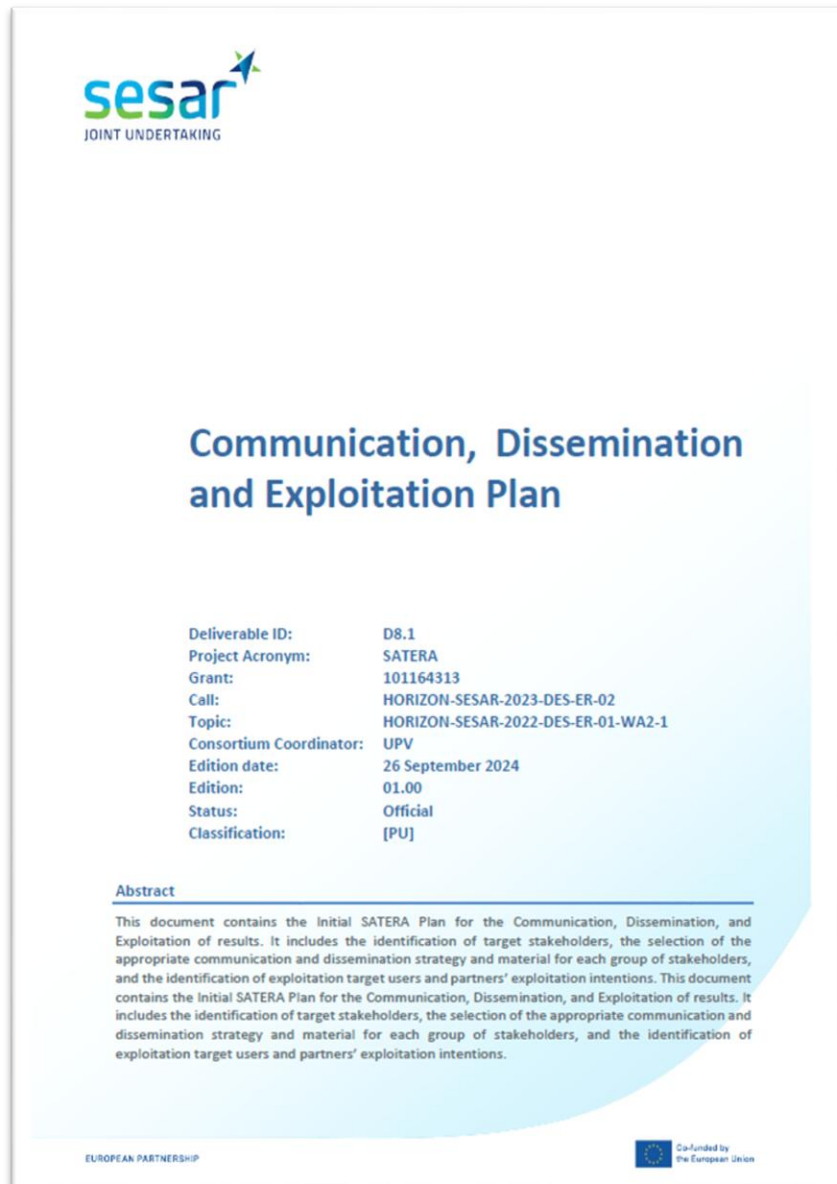
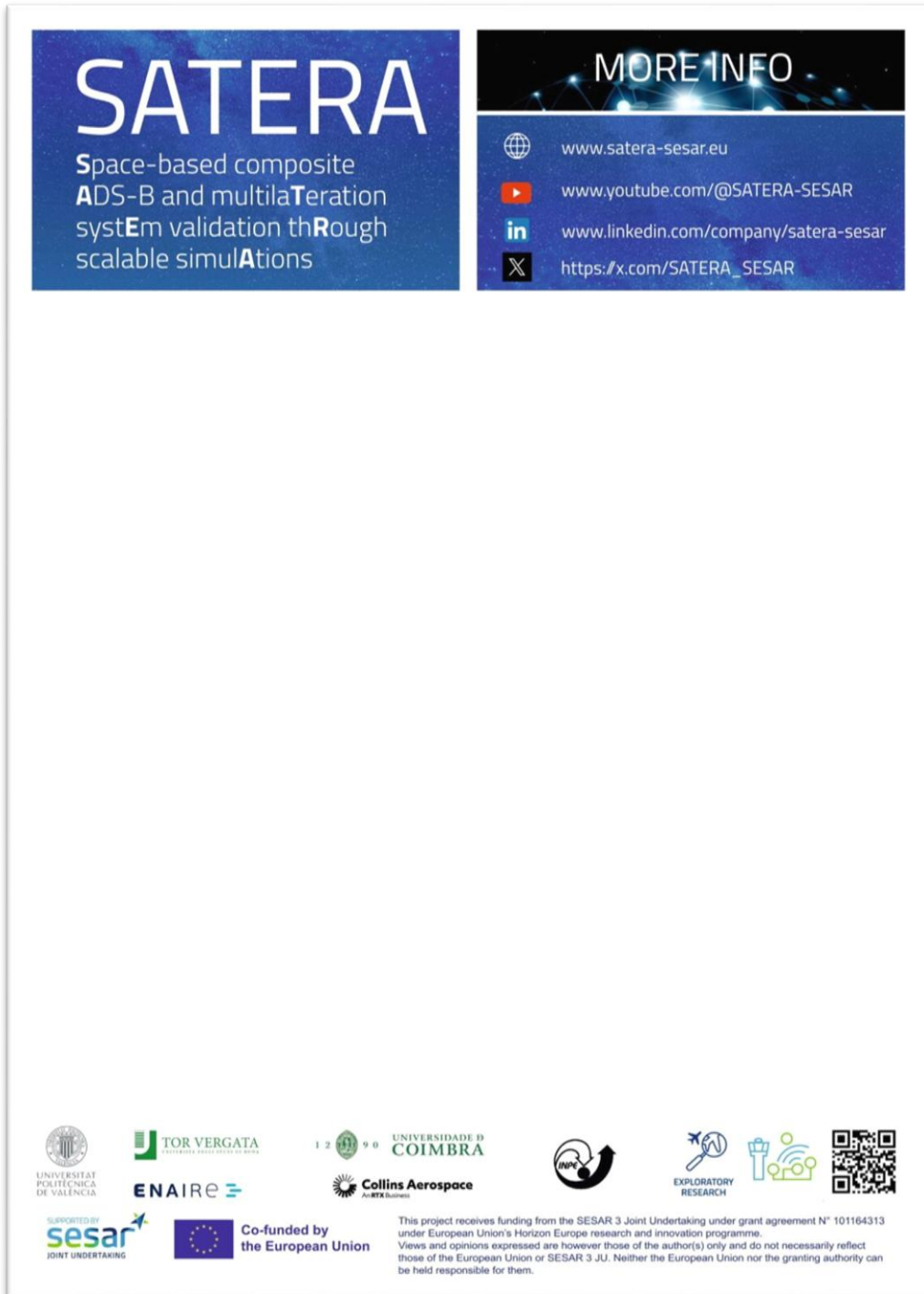


Figure 17 Example of a SATERA document

The template is available to all the partners in the internal repository, in the communication materials folders and on STELLAR platform.





2.8 Flyers Templates








The following templates were created to design flyers for communication events (Figure 18 and Figure 19).





SATERA
Space-based composite
ADS-B and multiTeration
system validation through
scalable simulations

MORE INFO

-  www.satera-sesar.eu
-  www.youtube.com/@SATERA-SESAR
-  www.linkedin.com/company/satera-sesar
-  https://x.com/SATERA_SESAR

SUPPORTED BY   **Co-funded by the European Union**

This project receives funding from the SESAR 3 Joint Undertaking under grant agreement N° 101164313 under European Union's Horizon Europe research and innovation programme. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or SESAR 3 JU. Neither the European Union nor the granting authority can be held responsible for them.

Figure 18 SATERA Flyer template (Dark), A4

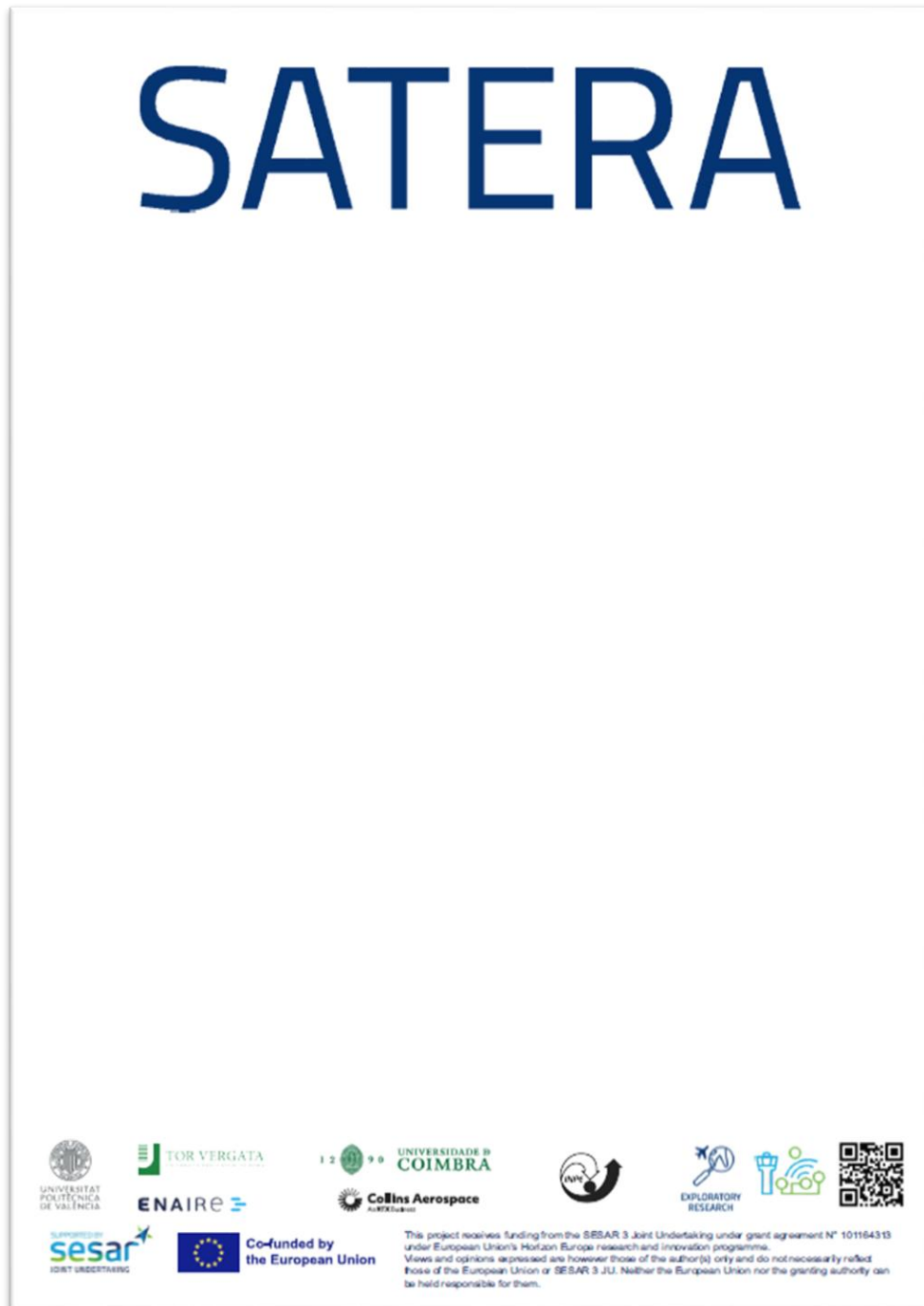


Figure 19 SATERA Flyer Template, A4

The templates are available to all the partners on the internal repository, in the communication materials folders.

2.9 Newsletter Template

The following template for the newsletters was created and is available for future use (Figure 20).



Figure 20 Newsletter Template

2.10 Stickers

Stickers in two standard formats (70x36cm and 105x74cm) were created for all the logos and are available for printing in A4 sheet (Figure 21, Figure 22, and Figure 23).



Figure 21 SATERA Logo Stickers (big)



Figure 22 SESAR 3 JU and EU Logos Stickers (big)



Figure 23 all-logos Stickers (small)

3 Website

The SATERA website serves as a primary channel for communication and dissemination of the project. It offers an overview of SATERA, detailing the project objectives, activities, and outcomes. Additionally, the website features news updates, event information, downloadable communication materials, and links to relevant external resources. It also provides regular updates on project progress, activity status, and other relevant communications related to SATERA.

The table below (from Initial CDE, [10]) describes the structure of the website.

Page	Content
Homepage	Header with logo and menu Banner with title and picture Project description Project objectives Latest news Footer with funding acknowledgments, contacts, social media links, link to SESAR 3 JU website
About page	Context Objectives and methodology Expected outcomes Advisory Board members
Consortium	Logos and descriptions
Results	Public deliverables Scientific publications Communication and dissemination material Solutions
News & events	News and events
Download	Documents of the project (brochures, posters etc.)

Table 1: SATERA preliminary website structure

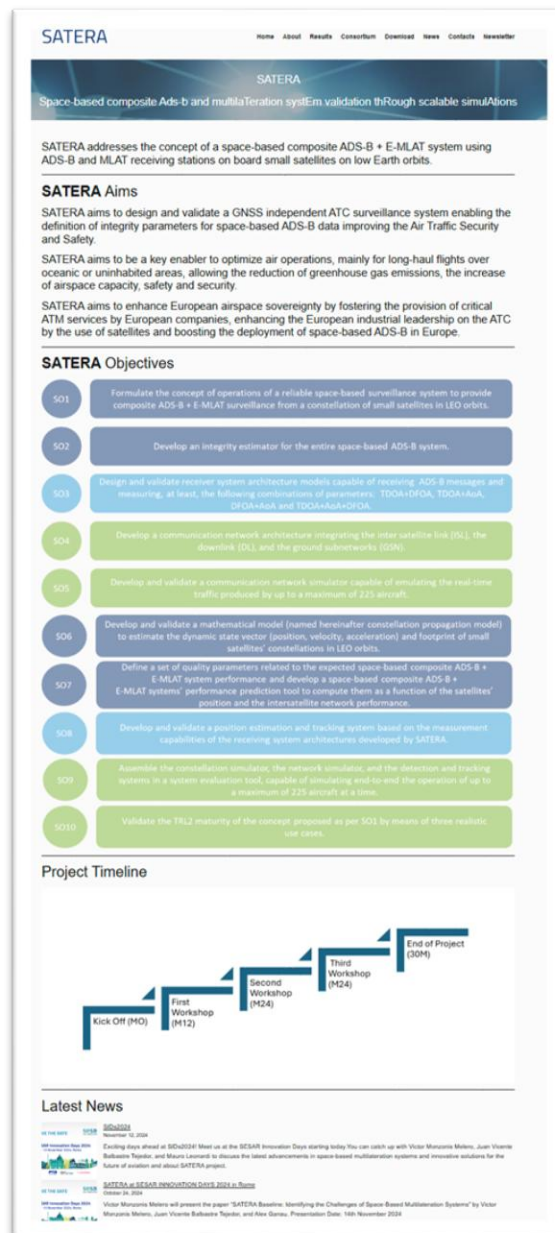
Additionally, the site offers access to the project's biannual electronic newsletter.

The project website URL is:

<https://www.satera-sesar.eu/>

The figures below present selected screenshots of various pages (Figure 24, Figure 25, Figure 26, and Figure 27).

The website will be linked to the SESAR 3 JU website of the project (<https://sesar.eu/projects/SATERA>)



SATERA

Home About Results Consortium Download News Contacts Newsletter

SATERA

Space-based composite ADS-B and multilateration system validation through scalable simulations

SATERA addresses the concept of a space-based composite ADS-B + E-MLAT system using ADS-B and MLAT receiving stations on board small satellites on low Earth orbits.

SATERA Aims

SATERA aims to design and validate a GNSS independent ATC surveillance system enabling the definition of integrity parameters for space-based ADS-B data improving the Air Traffic Security and Safety.

SATERA aims to be a key enabler to optimize air operations, mainly for long-haul flights over oceanic or uninhabited areas, allowing the reduction of greenhouse gas emissions, the increase of airspace capacity, safety and security.

SATERA aims to enhance European airspace sovereignty by fostering the provision of critical ATM services by European companies, enhancing the European industrial leadership on the ATC by the use of satellites and boosting the deployment of space-based ADS-B in Europe.

SATERA Objectives

- SO1 Formulate the concept of operations of a reliable space-based surveillance system to provide composite ADS-B + E-MLAT surveillance from a constellation of small satellites in LEO orbits.
- SO2 Develop an integrity estimator for the entire space-based ADS-B system.
- SO3 Design and validate receiver system architecture models capable of receiving ADS-B messages and measuring, at least, the following combinations of parameters: TDOA-DFOA, TDOA+AOA, DFOA+AOA and TDOA+AOA+DFOA.
- SO4 Develop a communication network architecture integrating the inter-satellite link (ISL), the downlink (DL) and the ground subnetworks (GSN).
- SO5 Develop and validate a communication network simulator (capable of emulating the real-time traffic produced by up to a maximum of 225 aircraft).
- SO6 Develop and validate a mathematical model (named hereinafter constellation propagation model) to estimate the dynamic state vector (position, velocity, acceleration) and footprint of small satellites' constellations in LEO orbits.
- SO7 Define a set of quality parameters related to the expected space-based composite ADS-B + E-MLAT system performance and develop a space-based composite ADS-B + E-MLAT system performance prediction tool to compute them as a function of the satellites' position and the intersatellite network performance.
- SO8 Develop and validate a position estimation and tracking system based on the measurement capabilities of the receiving system architectures developed by SATERA.
- SO9 Assemble the constellation simulator, the network simulator, and the detection and tracking systems in a system evaluation tool, capable of simulating end-to-end the operation of up to a maximum of 225 aircraft at a time.
- SO10 Validate the TRIZ maturity of the concept proposed as per SO1 by means of three realistic use cases.

Project Timeline

Kick Off (M0) → First Workshop (M12) → Second Workshop (M24) → Third Workshop (M24) → End of Project (30M)

Latest News

Exciting days ahead at SESAR2021! Meet us at the SESAR Innovation Days starting today! You can catch up with Victor Munoz-Mateo, Juan Vicente Balbastro Tapia, and Maria-Luisa Lopez to discuss the latest advancements in space-based multilateration systems and innovative solutions for the future of aviation and about SATERA project.

SATERA at SESAR INNOVATION DAYS 2021 in Rome

Victor Munoz-Mateo will present the paper "SATERA Baseline: Identifying the Challenges of Space-Based Multilateration Systems" by Victor Munoz-Mateo, Juan Vicente Balbastro Tapia, and Alex Gomez. Presentation Date: 18th November 2021

Figure 24 Website -Homepage

SATERA
Home About Results Consortium Downloads News Contacts Newsletter

SATERA

Space-based composite ADS-B and multilateration system validation through scalable simulations

About the Project

Introduction

Automatic Dependent Surveillance–Broadcast (ADS-B) is a surveillance technology in which airborne equipment automatically broadcasts aircraft location to ground stations.

ADS-B is one of the pillars of state-of-the-art Air Traffic Control (ATC) systems and today it is considered as the future air traffic surveillance systems.

Unfortunately, it has some drawbacks related to the use of GNSS data and the use of open (and not secured) protocol, and usually, a secondary independent surveillance system is needed.

For this purpose, SATERA aims to formulate and validate the concept of a space-based ADS-B signals multilateration system leveraging a constellation of LEO satellites.

SATERA will use hybrid localization techniques combining time-of-arrival (ToA), angle-of-arrival (AoA) and frequency-of-arrival (FoA) measurements, leading to the concept of enhanced multilateration (E-MLAT) from the Space.

Concept

SATERA proposes the design, development, and proof of a space-based composite ADS-B + E-MLAT system concept. This idea arises mainly from the need to verify and validate the GNSS data received on the ground from space-based ADS-B systems by means of an independent (i.e., non-GNSS-based) system.

The concept proposed by SATERA will consider that the receiving stations are on board of small satellites in a constellation deployed in the low Earth orbit (LEO) to provide the space-based ADS-B service. The ADS-B information broadcasted by the aircraft will be received on board each satellite of the constellation by specific equipment that will measure one or more characteristics of the electromagnetic waves carrying ADS-B messages (e.g., ToA, AoA, and FoA).

This information will then be relayed between the different satellites and sent through a downlink connection to the central processing station (CPS) on the ground. As the space channel is harsh and quite band limited, appropriate data encoding (including compression) and routing algorithms will be used to prevent the measured data from being affected by the channel noise and by network congestion, thus ensuring that the required information reaches the CPS on time to be properly processed.

Once data reach the CPS, they will be processed using multilateration techniques, and the position of the aircraft will be estimated. The estimation will be compared with the reported position provided in the ADS-B messages and an integrity indicator will be added to the ADS-B Target Report. Lastly, both reports (ADS-B and E-MLAT) will be injected into the ATM surveillance chain for ATC purposes.

The satellite constellation. In a space-based multilateration system, the receiving stations are on board of the constellation satellites. Hence, the quality of the aircraft computed position will be affected by the dilution of precision (DOP) caused by the relative position and speed of the aircraft and the satellites, as well as by the number of satellites within the range of the aircraft ADS-B emitter. Thus, the configuration of the constellation shall ensure that the satellite's orbits and revisit times (that will determine the coverage area for each satellite at any time) will allow the system to meet the required performance expressed in terms of an error bound estimator (e.g., the Constant Risk lower bound) while optimally using the space resources (i.e., minimizing the number of satellites) and guaranteeing the required network connectivity. To ensure the independence of the MLAT generated position data from GNSS-derived ones, satellite positions shall not solely rely on GNSS data. Therefore, the SATERA satellite constellation design will include mechanisms to accurately determine the satellite positions along their orbits without using GNSS positioning or, at least, to enable an integrity assessment of GNSS data before they are used by the localization algorithms in the central processing station.

The receiving stations. Receiving stations will be in charge of listening to the ADS-B messages broadcasted from aircraft and measuring the physical characteristics of the electromagnetic waves carrying them. The receiving stations will consist of a radio front end in charge of receiving the electromagnetic signal at 1,090 MHz and down-converting it to a frequency at which the signal may be digitized and processed to measure the time of arrival and the Doppler shift. The radio front end will also allow to measure the angle of arrival of the received signal. Measuring other aircraft position-related parameters (not only the ToA) can be very useful in satellite-based MLAT because they can contribute to improve the DOP of the solution (or, in other words, the condition number and the ill-conditioning of the inverse problem to be solved to compute the aircraft position). To measure the ToA and to timestamp the digitized messages, the receiving stations shall have a local onboard clock synchronized with those onboard the rest of the cluster of satellites used to multilaterate the aircraft position. For similar reasons, the local oscillators used to measure the Doppler shift shall have a controlled drift. SATERA will design and validate the receiving stations' architecture considering the components currently used in receiving stations on the ground (i.e., not space grade). Since these components (generically considered off-the-shelf COTS components) are sensitive to space radiation and may have relatively high rates of hardware transient faults, the proposed architecture will use software implemented fault-tolerant (FT) techniques (or hybrid FT techniques) to ensure that the receiving stations and associated processing can tolerate the transient faults induced by space radiation and provide a similar level of reliability as receiving stations on the ground.

The communications network. This component will be tasked with getting the relevant data from each receiving station to the CPS, where they will be correlated (i.e., associated to a single emitter) and the position of the aircraft calculated. The communication will be performed through two subnetworks: into satellite link (SSL) and downlink (DL). The SSL will connect nearby satellites between them so that data measured on board a satellite can be seamlessly routed through the constellation and reaching a satellite from which a downlink connection with a suitable ground station is feasible. Being ATC a real-time process, it is crucial that aircraft positions are timely computed, and the ADS-B data validated. Moreover, data measured from the same emitter signal must be received within a rather narrow time window. The communication latency will be mainly introduced by the SSL subnetwork. Therefore, to prevent ADS-B validated data from exceeding the data age required by EUROCAE standards ED-

Figure 25 Website – About page

SATERA
Home About Results Consortium Download News Contacts Newsletter

SATERA

Space-based composite Ads-b and multilateration system validation through scalable simulations

Consortium



UNIVERSITAT POLITÈCNICA DE VALÈNCIA

Universitat Politècnica de València – UPV (Spain), is a leading university in Spain, being the only Science and Technology University in Spain to feature in all worlds' university rankings. It is among the Spanish Universities with the highest revenue from competitive research (R&D) contracts, consulting and service delivery, spin-off) and a national leader in patent exploitation. UPV coordinated 126 projects of Horizon 2020 of a total granted of 197 and is currently coordinating 30 projects under Horizon Europe from a total of 133 granted (October 2024).

UPV's Air Navigation System (SNA) research group and Antennas and Propagation Lab (APL), both located in the UPV Scientific Park, have a sound experience in research activities in the field of Air Traffic Management (ATM), U-space services and Communication Navigation and Surveillance (CNS) systems, and on the design of antennas for microwave, millimetre, and THz applications, as well as on the study of the propagation and modelling of the radioelectric channel, respectively.

The UPV plays a leading role in the development of the future Single European Sky, coordinating SESAR 3 Exploratory Research projects U-AGREE and SATERA, paving the way for new services ranging for the very low-level operations over urban areas to space-based CNS, and participating as beneficiary in the Digital Sky Demonstrator U-ELCOMÉ (the largest U-space demonstrator ever conducted in Europe), as well as in the SPATIO Fast Track project contributing to the development of the future advanced U-space ecosystem.

The UPV team is involved in the concept definition of a space-based composite surveillance system (ADS-B+ E-MLAT) and its components. Furthermore, the UPV develops some of the main components of such system, e.g., the multibeam monopulse antennas to measure the signal AoA as part of the E-MLAT concept and the advanced tracking and data fusion algorithms that are needed in the central processing station to integrate the MLAT and ADS-B data streams into a single, composite one. The UPV is also in charge of the integration of the different system components in a system evaluation tool that supports the intermediate validation of the initial concept and the formulation of the final one, as well as the development of the system demonstrator meant to validate and fine-tune that final concept.



TOR VERGATA
UNIVERSITÀ DEGLI STUDI DI ROMA

University of Rome Tor Vergata, established in 1982, it spans 600 hectares and houses significant research organizations such as the National Research Council (CNR) and the Italian Space Agency (ASI). The University of Rome Tor Vergata will take part in SATERA through its Electronic Engineering Department, which excels in radar and next-generation surveillance systems, notably ADS-B and multilateration systems. The University of Rome Tor Vergata SATERA Teams has extensive experience in statistical bounds for hybrid multilateration systems, solving ill-conditioned multilateration problems, and ADS-B degrading. Their contribution will be pivotal in developing the system evaluation tool, measuring Time of Arrival (ToA) and Frequency of Arrival (FoA) at receiving stations, and creating localization algorithms.



UNIVERSIDADE DE COIMBRA

University of Coimbra UC (Portugal) is a reference institution in higher education and research in Portugal. The Faculty of Sciences and Technology (FCTUC) includes the Department of Informatics Engineering (DEI) and exploits its knowledge transfer and scientific potential through Pedro Nunes Institute (IPN), the 2011 Best Science-Based Incubator. The participation of the UC is through the Centre for Informatics and Systems of the UC (CISUC), which is a large research center (+250 researchers) in the field of Informatics and Communications. CISUC's team (belonging to two research groups of CISUC) has been working on software dependability and security, system architecture, fault tolerant architectures, computer networks and cybersecurity, mainly from the perspective of assurances by means of analytical, simulation, and experimental evaluation techniques. Previous projects of the CISUC's team include many EU projects from the Esprit III, Esprit IV, FP5, FP6, FP7 and H2020, as well as projects with NASA, JPL and INPE from the Brazilian Space Agency. CISUC's team is also wellknown by its record in creation of spin-off companies, started by former PhD students as consequence of previous EC projects.



Collins Aerospace

Collins Aerospace Ireland Ltd. (CAI). The Networks & Embedded Systems team at Collins addresses key challenges of applying emerging communications and computing technologies in the aerospace domain through close collaboration across Collins Aerospace, as well as with leading academic and external research partners. Among other focus areas, they deal with on-aircraft and air-to-ground communications systems for Communications, Navigation, and Surveillance (CNS) – including performance improvements of existing operational systems and evaluation of emerging technologies (5G and Non-Terrestrial Networks, or NTN) for seamless global coverage. The experience of CAI in the CNS domain will be crucial to define the SATERA concept and the integrity indicator, as well as to the Constellation propagation model. CAI will also be in charge of the definition of the use-case in the North Atlantic corridor, leveraging the data provided by the FlightAware tool.



ENAIR

Enaire (Spain) is the fourth-largest national air navigation manager in Europe in terms of traffic volume and one of the ten largest air traffic controllers worldwide. Enaire manages one of the largest airspaces in Europe, 2,190,000 square kilometers and is renowned internationally for being at the forefront in the use of technologies and solutions in its area of activity. In 2019, it managed 2.1 million flights to and from four continents (Europe,

Figure 26 Website – Consortium page

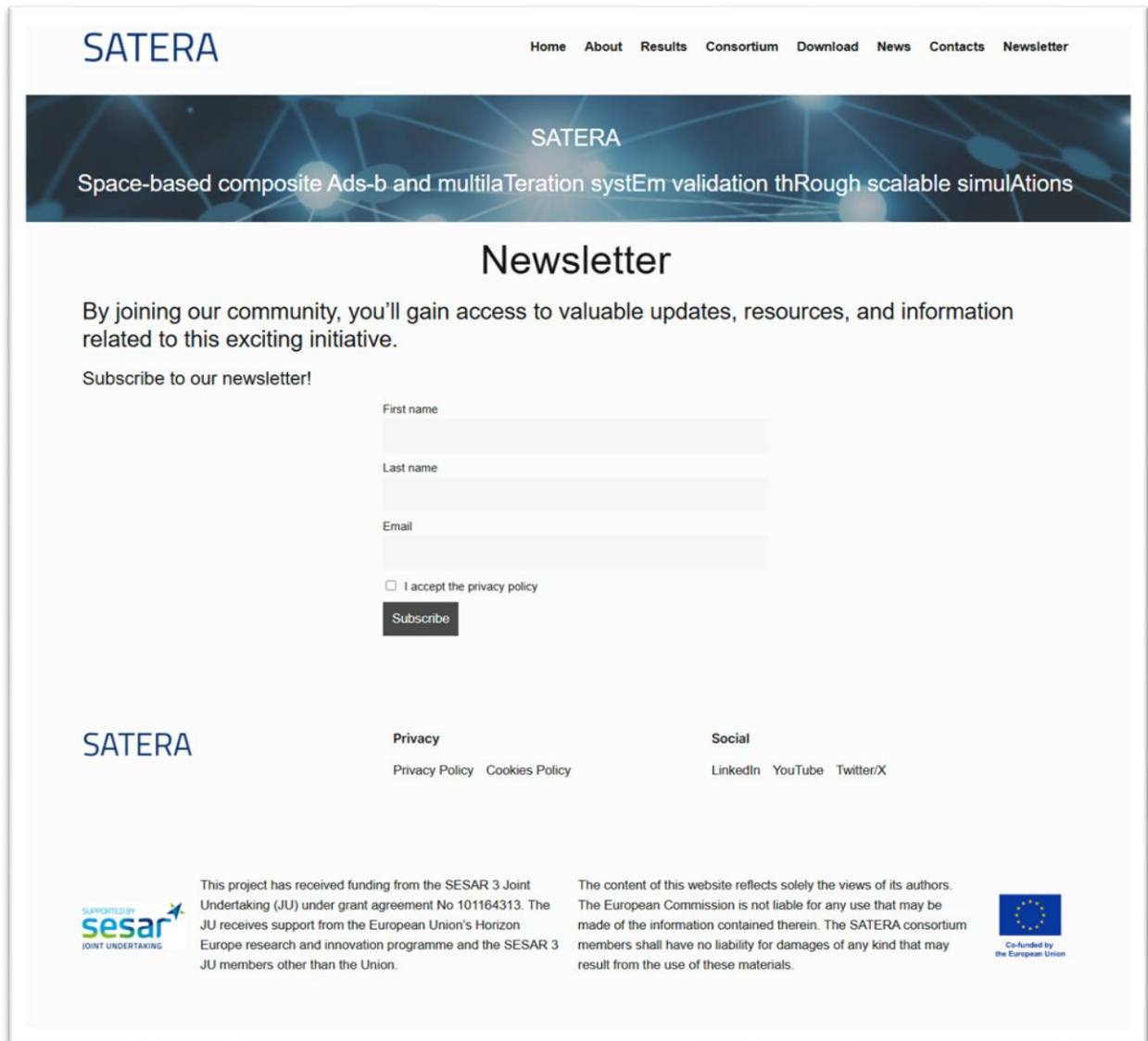


Figure 27 Website – Newsletter page

4 Press releases

Press releases are official announcements sent to selected members of the news media to publicize noteworthy information. They will be concise, engaging news stories designed to capture the attention of journalists and/or publications.

Press releases' structure will respect the guidelines provided by SESAR 3 JU in the *DES HE CDE Plan - Annex I - Press releases*.

Press notes about the project will be prepared whenever significant events or activities occur. These notes will be crafted by the task leaders responsible for each development and then distributed by all partners through their respective networks.

When possible, they will include logos and banners as described in the visual identity section.

Up now, SATERA was cited in three different press releases:

- SESAR3 JU news on the Kick-off for 18 new SESAR exploratory research projects (19 September 2024), <https://www.sesarju.eu/news/kick-18-new-sesar-exploratory-research-projects>
- SNA-ITACA website news, on the participation to the SESAR Innovation Days in Rome, <https://www.itaca.upv.es/the-sna-itaca-group-highlights-at-the-sesar-innovation-days/>
- Tor Vergata university website news, on the participation to the European Researcher's Night in Rome (<https://web.uniroma2.it/it/contenuto/roma-tor-vergata-protagonista-della-notte-europea-dei-ricercatori-e-delle-ricercatrici-2024>)

5 Flyers

A first flyer for general communication events was created.

It contains the project contact information, the consortium logo, the main aims of the project and its short abstract (Figure 28). It is available on the internal repository and on the SATERA website (<https://www.satera-sesar.eu/download/>).

The flyer is a vertical rectangular layout with a dark blue background and white text. It is divided into several sections:

- Top Left:** Large white text "SATERA" followed by "Space-based composite ADS-B and multiTeration systEm validation thRough scalabLe simulAtions".
- Top Right:** "MORE INFO" section with social media links for website, YouTube, LinkedIn, and X.
- Middle Left:** "Exploratory Research" section with dates "July 2024–December 2026" and a brief description of the project's goal.
- Middle Right:** "ABSTRACT" section containing a detailed summary of the project's objectives and challenges.
- Bottom Left:** "MAIN AIMS" section with three bullet points detailing the project's goals.
- Bottom Right:** A photograph of an airplane flying in a blue sky.
- Bottom:** A row of logos for partner institutions: Universidad Politécnica de Valencia, IOR VERGATA, ENAIRE, Universitade B COIMBRA, and Collins Aerospace. Below these are logos for "supported by sesar JOINT UNDERTAKING" and "Co-funded by the European Union". A QR code is also present.
- Bottom Center:** A small disclaimer text: "This project receives funding from the SESAR 3 Joint Undertaking under grant agreement N° 101164313 under European Union's Horizon Europe research and innovation programme. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or SESAR 3 JU. Neither the European Union nor the granting authority can be held responsible for them."

Figure 28 SATERA Flyer for general event (First version)

6 Roll-ups

Two Roll-ups to be used for communications, were already created and are available in the internal repository. The first one was already used for the project Kick-off Meeting, and the second one was used in the European Researchers' Days in Rome. They are reported in the following figures (Figure 29 and Figure 30). All the roll-ups are also available on the website (<https://www.satera-sesar.eu/download/>).

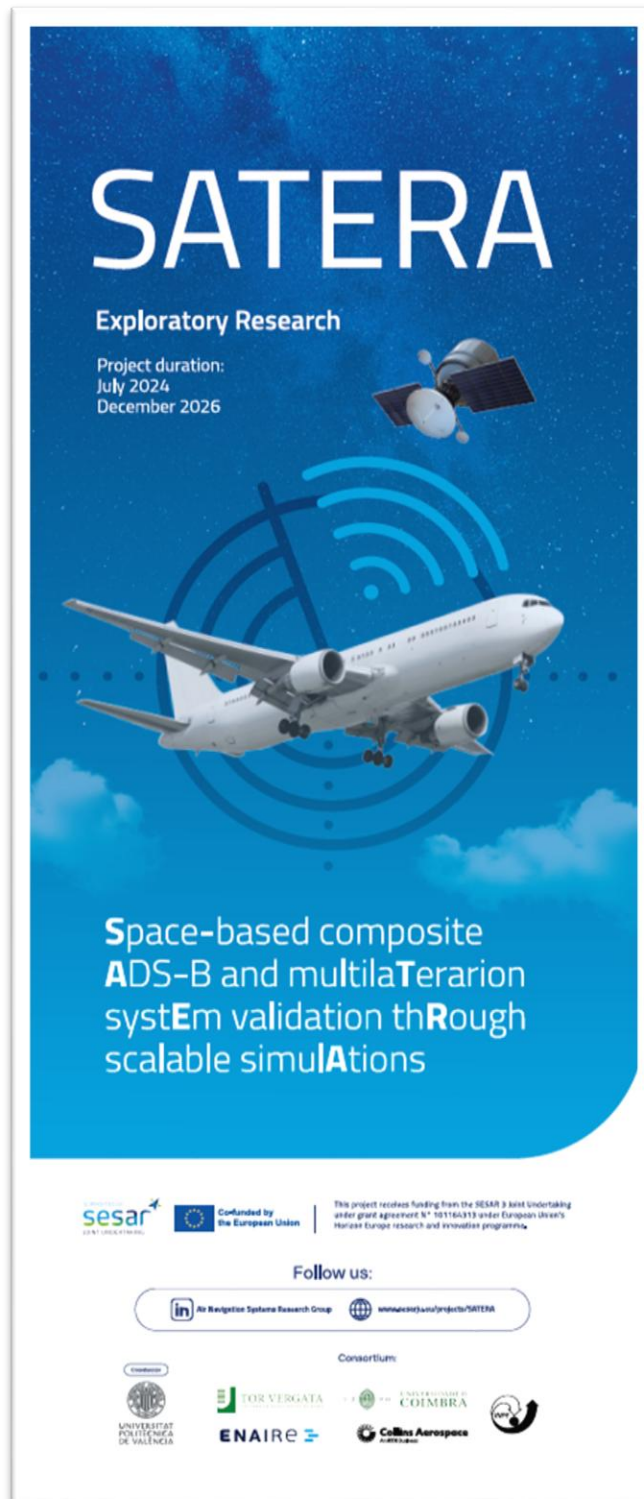


Figure 29 SATERA Roll-up (version A)



SATERA

Space-based composite
ADS-B and multilateration
system validation through
scalable simulations


Exploratory Research
July 2024–December 2026


SATERA proposes a space-based aeronautical surveillance system that utilizes small satellites in low Earth orbit to enhance air traffic safety and security in remote regions, such as oceanic routes

SATERA will design and validate a GNSS-independent air traffic control (ATC) surveillance system, establishing integrity parameters for space-based ADS-B data to improve air traffic safety and security

SATERA aims to be a key enabler in optimizing air operations, particularly for long-haul flights over oceanic and uninhabited areas, by reducing greenhouse gas emissions, increasing airspace capacity, and enhancing safety and security

SATERA aspires to strengthen European airspace sovereignty by promoting the provision of critical air traffic management (ATM) services through European companies. This initiative will enhance Europe's industrial leadership in ATC by leveraging satellite technology and accelerating the deployment of space-based ADS-B systems across the continent

SUPPORTED BY  **JOINT UNDERTAKING**

Co-funded by  **the European Union**

This project receives funding from the SESAR 3 Joint Undertaking under grant agreement N° 101184313 under European Union's Horizon Europe research and innovation programme. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or SESAR 3 JU. Neither the European Union nor the granting authority can be held responsible for them.

Follow us:
<https://www.sesarju.eu/projects/SATERA>

Consortium:






     

Figure 30 SATERA Roll-up (version B)

7 Social media

The consortium has created three social media accounts (on X, LinkedIn, and YouTube).

These channels will facilitate continuous communication with specialized audiences, institutional bodies, and the public.

Through these platforms, the project shares articles and updates from the SATERA website, promotes events, shares videos, disseminates findings and results, and maintains regular engagement with related projects. The project will also be integrated with all relevant social media channels of the EC and SESAR 3 JU.

7.1 LinkedIn

A SATERA account was created on LinkedIn:

<https://www.linkedin.com/company/satera-sesar/>

The account profile is reported in the following figure (Figure 31).

UNITOV will manage the profile to help in the dissemination of project activities and results.

The official language of the profile is English, and the account is considered a useful way to immediately disseminate project activities and news to a wide audience, as well as to raise awareness about the latest news and trends in the ADS-B + E-MLAT via LEO Satellite (an example of post is reported in Figure 32).

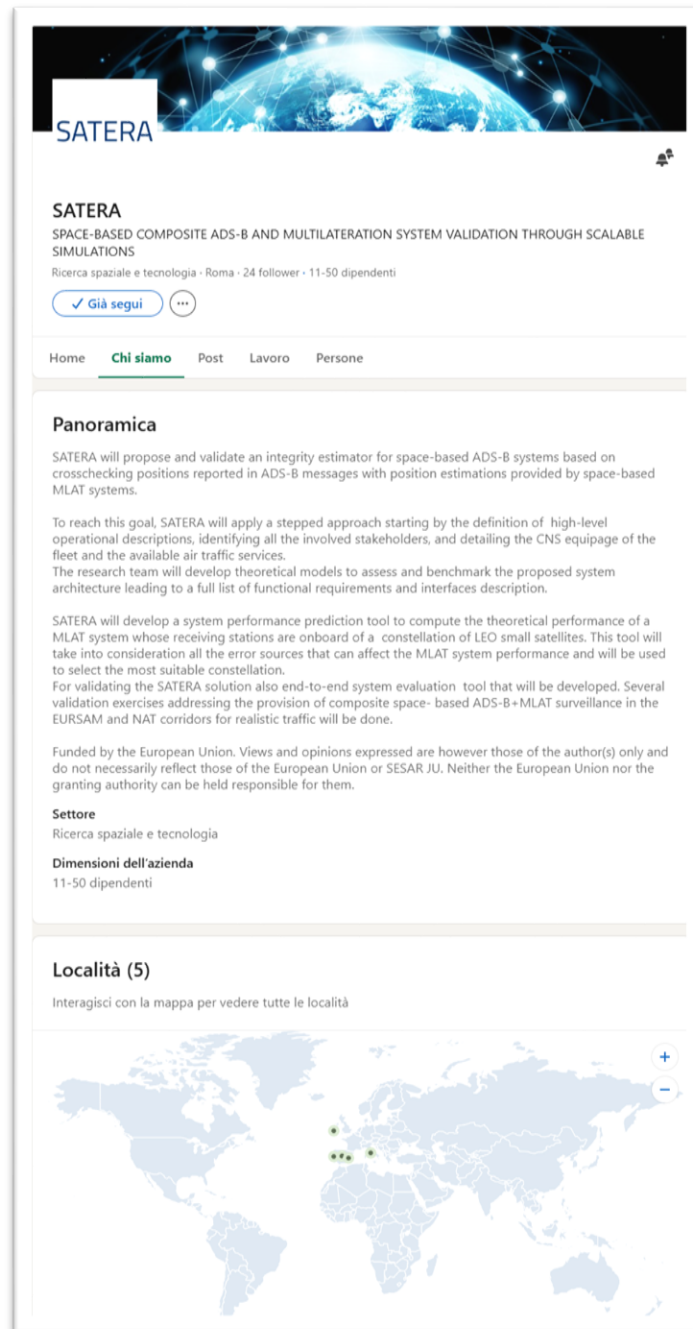


Figure 31 SATERA account on LinkedIn

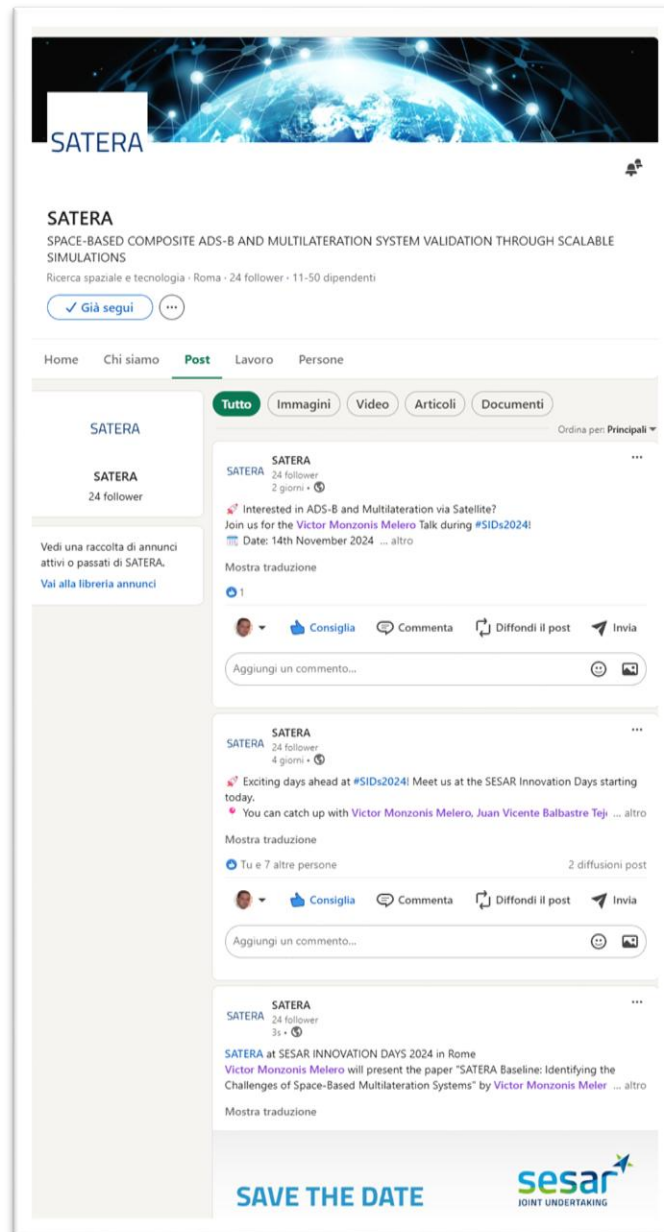


Figure 32 SATERA account on LinkedIn, example of posts

7.2 X

A SATERA account was created on X:

https://x.com/satera_sesar

The account profile is reported in the following figure (Figure 33).

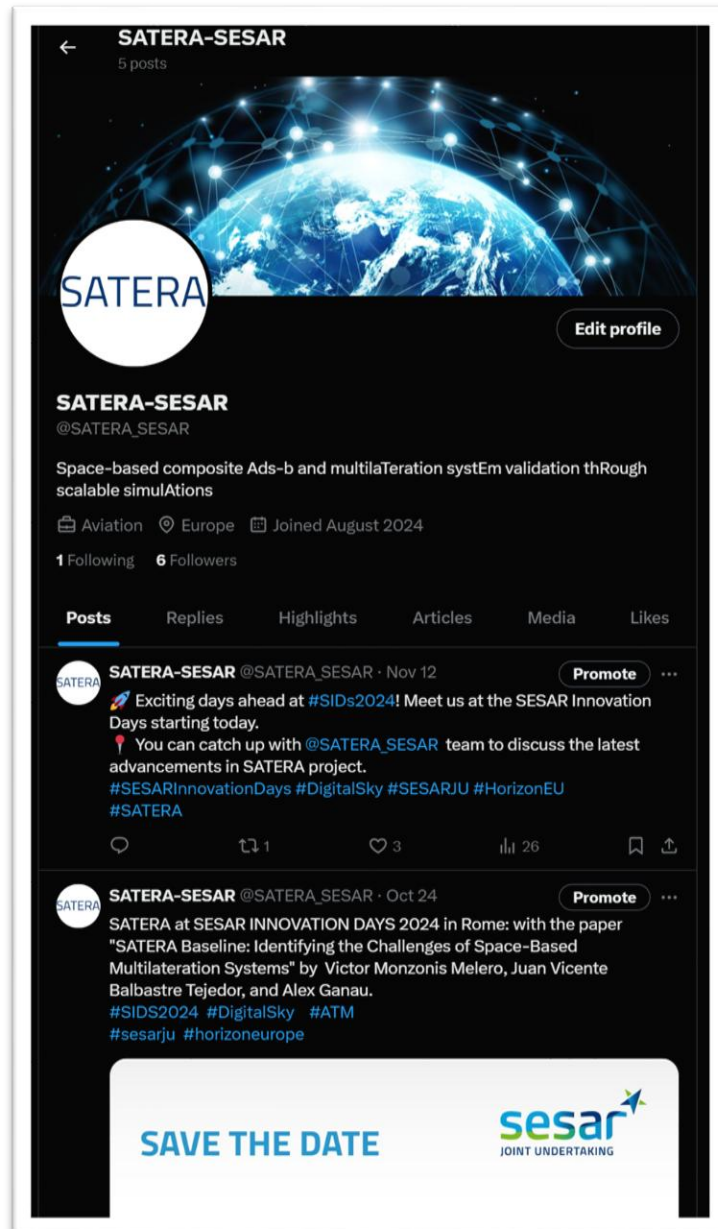


Figure 33 SATERA account on X

The X account is administrated by UNITOV, which regularly upload posts, referring to results and news on the project, and any important information that is relevant to the project. The official language of the tweets is English, even though re-post might be made from original posts in other languages, mainly those of partners. The X account is considered a useful channel to immediately disseminate project activities and news to a wide audience, as well as to raise awareness about the latest news and trends in the ADS-B + E-MLAT via Leo Satellite.

7.3 YouTube

A SATERA account was created on YouTube:

<https://www.youtube.com/@SATERA-SESAR>

The account profile is reported in the following figure (Figure 34).

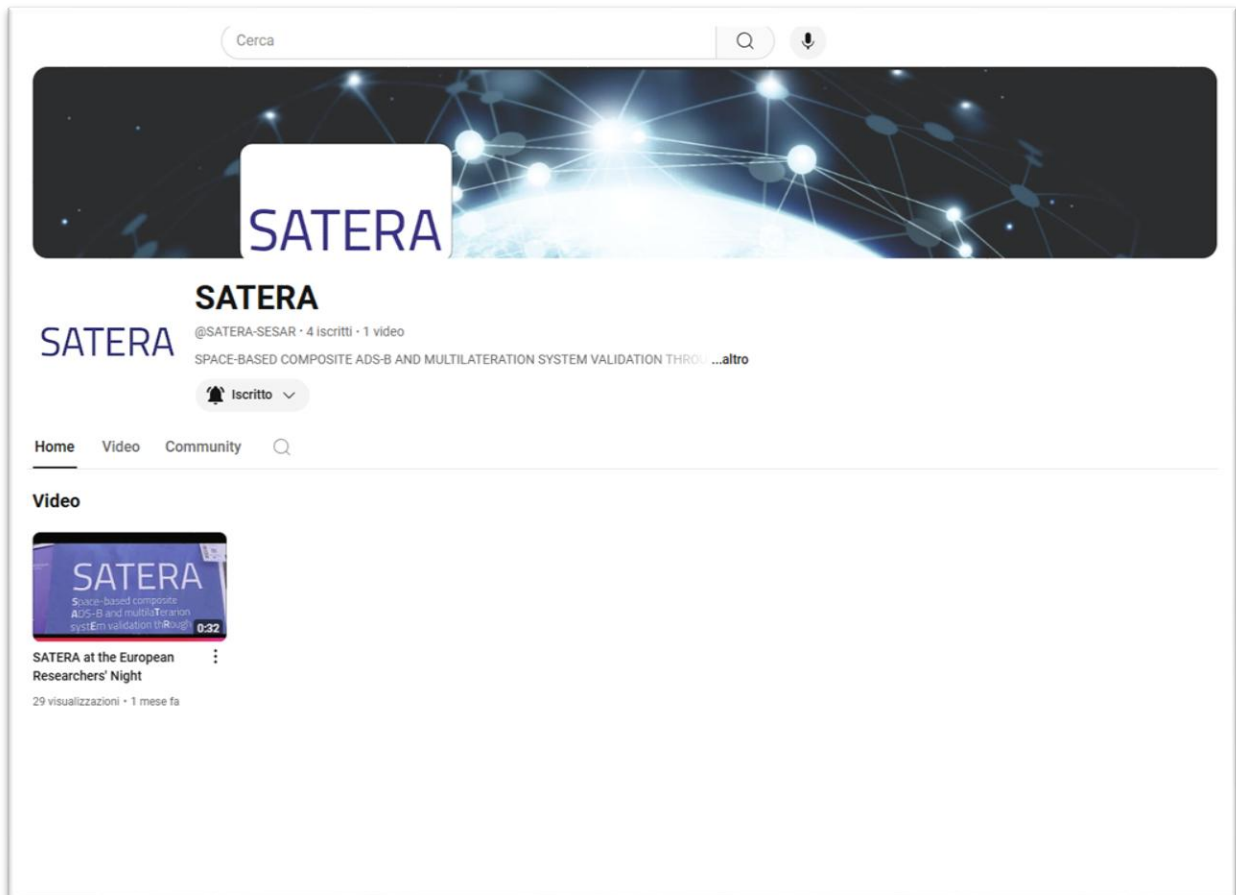


Figure 34 SATERA account on YouTube

8 Videos

Three videos aiming at raising awareness of the project and its expected outcomes will be disseminated for partners to use to present the project, as well as for press relation purposes (Table 2 from [10]).

A first video that aims at presenting the manifold aspects of SATERA, the objectives and impacts of the project, as well as the technical solutions proposed to achieve them (Concept video Teaser), was created following the guidelines given in [5].

Videos	Description	Planning	Link
Concept video Teaser	A teaser to divulgate the project's objectives and expected benefits.	Toward M6	N/A
Interviews	A partners' interviews video aiming at introducing partners, explaining the research activities in which they are involved and describing the features of SATERA technology	Toward M15	N/A
Results	A final video will be produced to summarise project's outcomes and showcase demo activities (toward M30)	Toward M30	N/A

Table 2: SATERA videos

The SATERA teaser video is available in the internal repository, in the SATERA WebSite (<https://www.satera-sesar.eu/download/>) and on the SATERA YouTube Channel (<https://www.youtube.com/watch?v=cJ1nE2RFAKg>)

In the following figure, it is possible to see the main highlights of the video. The SATERA video intro and outro developed by SESAR 3 JU are also available on the internal repository.

SATERA



Co-funded by the European Union

Every day, approximately 100,000 aircraft fly over our heads

Long-haul flights over oceanic or remote areas constitute a significant portion of global air traffic (6% in Europe)

Automatic Dependent Surveillance-Broadcast (ADS-B) is used to control this huge traffic



Aircraft broadcast their GNSS-derived position to the ground

Radars guarantee a position redundancy check over continental areas...

...but Radars and ground-based ADS-B receivers are not available in remote areas

Solution?



SATERA

SATERA will optimize air operations over oceanic areas

SATERA will reduce the greenhouse gas emissions

SATERA will enhance European airspace sovereignty

SATERA designs and validates a GNSS independent surveillance system

SATERA Rationale



1. LEO Satellites receive the Aircraft ADS-B messages
2. The messages are transmitted to the ground along with MLAT measurements
3. On the ground, MLAT-derived position are computed for redundancy check

SATERA Outcomes

- Functional requirements** of a space-based composite ADS-B + EMLAT
- Evaluation tool** of space-based composite ADS-B + E-MLAT surveillance system
- Space-based E-MLAT systems' **performance prediction tool**
- Simulators** of MLAT receiving stations, Communication network, and central processing station



Consortium



Figure 35 SATERA Teaser Highlights

9 List of acronyms

Acronym	Description
CDE	Communication, Dissemination and Exploitation
GA	Grant Agreement
N/A	Not Available
SESAR 3 JU	SESAR 3 Joint Undertaking
TBD	To Be Determined

Table 3: List of acronyms