



Galileo Test Range



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The Galileo Test Range

- The GTR, in its lifetime, shall represent the permanent facility and the technological centre conceived to achieve the following:
 - Characterization & Verification of the new Navigation Signals: GPS L2C, GPS L5, EGNOS L1, EGNOS L5, GSTB-V2 & GALILEO
 - Support the certification process of Galileo, GPS & EGNOS Receivers
 - Define & Experiment Application Prototypes in navigation area
 - Define & Provide navigation services
 - Being the reference point for local industries and research institutes for navigation related disciplines



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Development and operational phases

- The development of the GTR is foreseen in three phases, in order to match the capabilities of the system with the development plan of Galileo:
 - **Phase A:** Definition and Start up: implementation of the initial system, based on the generation on ground of navigation signals (GPS-like) using pseudolite technology and to receive real signals coming from GSTB V2
 - **Phase B:** Full deployment and initialization of the GTR: implementation of the GTR final configuration, not only able to generate Galileo-like signals, but also to receive and process real signals coming from the 4 Galileo IOV satellites
 - **Phase C:** With the phase C the GTR operational life will start.



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State of the art

- The Phase A has been accomplished on August 2007. All the performance requirements have been reached
- The GTR is ready to start the Phase A Operational services
- The GTR is ready to enter into the next Phase B



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GTR main actors

- The GTR Phase A has been committed and will be owned by FILAS S.p.A (Regione LAZIO).
- The GTR Phase A has been realized by a group of industries composed by Telespazio, Thales Alenia Space and Finmeccanica.
- The GTR Phase B will be committed by A.S.I.



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Capabilities of GTR Phase A

- To acquire and process Signals coming from 4 Pseudolites, from GPS, from EGNOS and from the GSTB V2 experimental satellite
- To generate GPS like signals from 2 fixed and 2 mobile Pseudolites
- To carry out analysis and experimentation on the GPS, EGNOS and GSTB-V2 signals (the latter at least for the L1 frequency band)
- The availability of a characterized environment in the Test Area
- The physical realization of a high-stable local time reference, through the time laboratory within the GTR.
- The geo-referenced network and a local “augmentation” of the navigation performance in support to the development of applications prototypes based on the use of navigation GPS+EGNOS signals.
- Differential reference stations with complete support for DGPS and RTK applications



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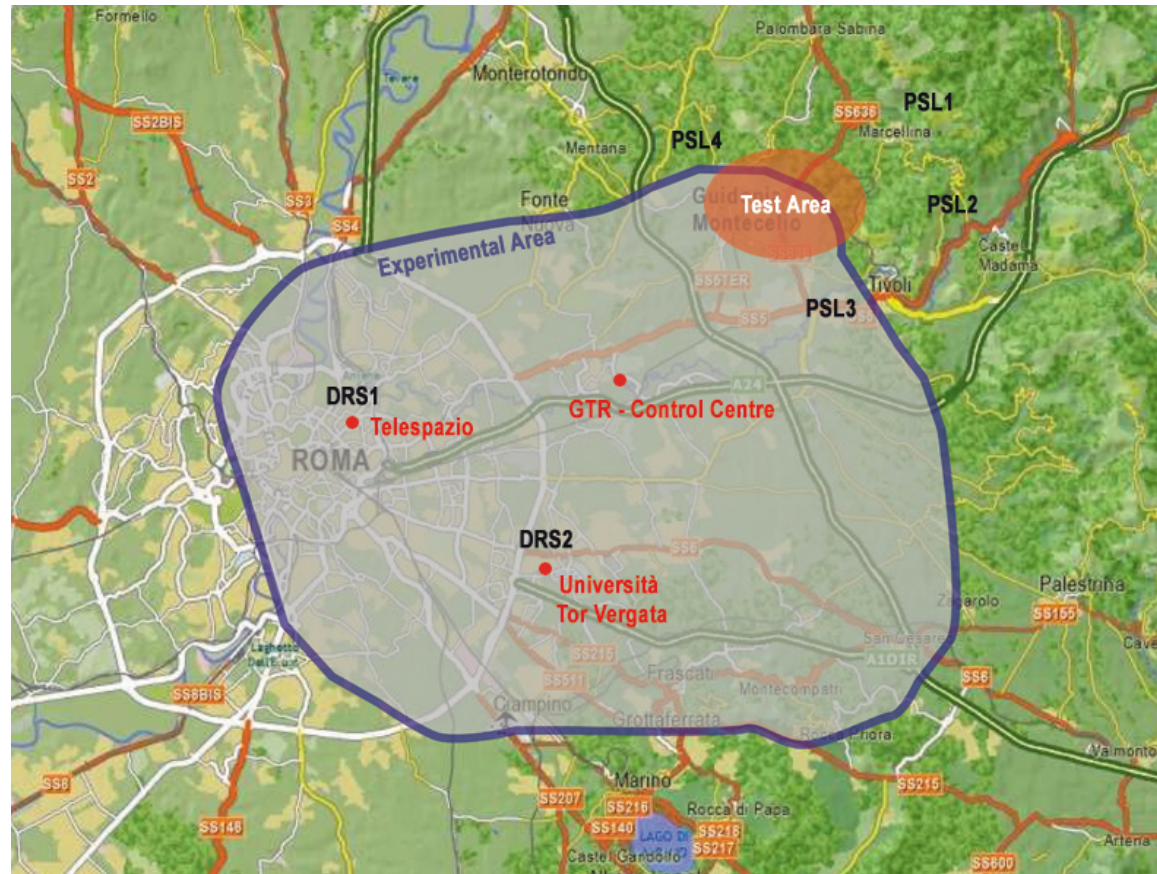
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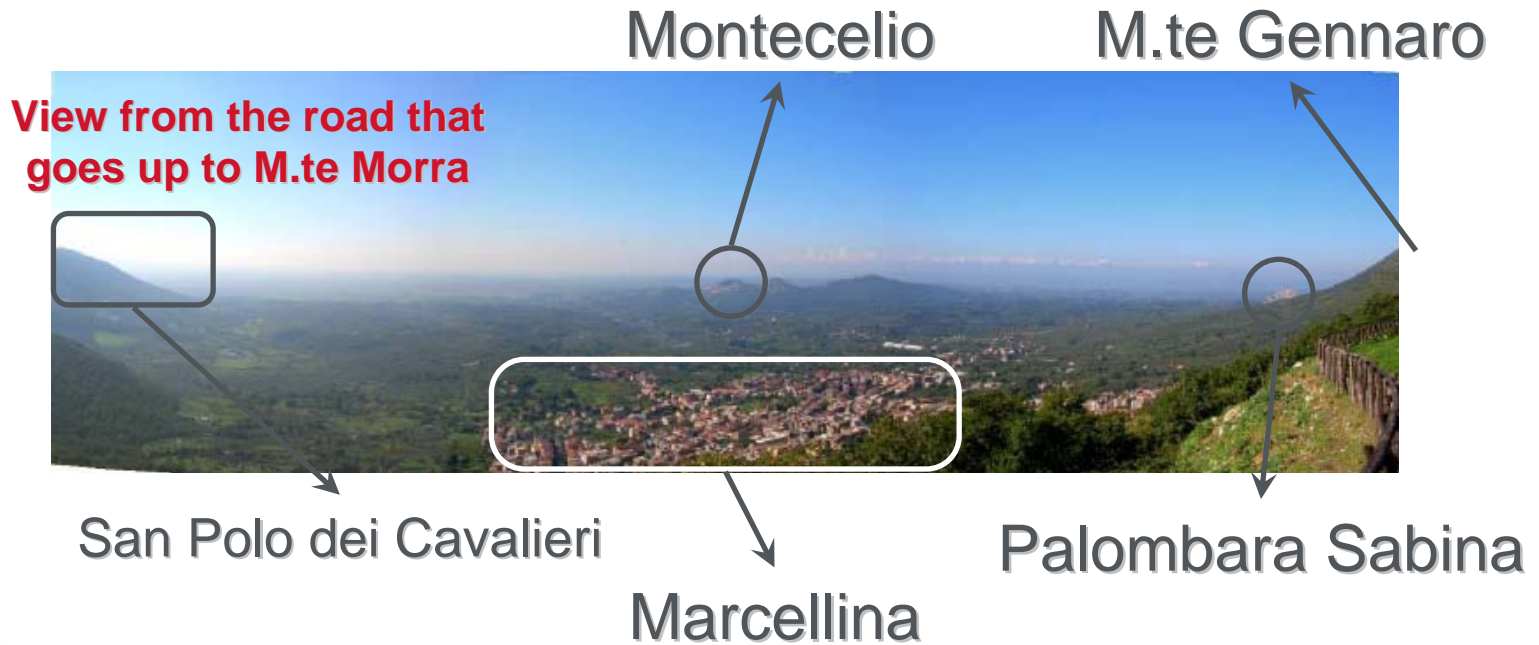


The Architecture Deployment



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-  TELESPAZIO
A Finmeccanica / Thales Company
-  ThalesAlenia Space
-  FINMECCANICA

View of the Phase A Test Area



Next Phases Capabilities

- **In Phase B, the GTR will increase its capabilities:**
 - All the GTR elements (Pseudolites, Sensor Station, Differential Reference Station, etc.) will be upgraded to manage the GALILEO Signal and specific performance will be improved.
 - The Pseudolites will increase from 4 to 9 (5 of which mobile). A new mobile Sensor Station will be added.
 - The GTR Operative and Logistic infrastructure will be developed to support the final operative Phase



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Conclusions 1/2

- The proposal of constituting an international Center of Excellence for Satellite Navigation and its Applications follows the strategy of growth of industrial and technological capabilities in the frame of an industrial development policy pursued by Regione Lazio in the region and by Italian Space agency at National level
- GTR represents the bridge between demand and offer for a myriad of satellite navigation downstream applications and services enabled by the innovative features of EGNOS and Galileo



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Conclusions 2/2

- SMEs that wish to step into the new business of satellite navigation, have been particularly addressed during the development of the project
- Particular importance has the role of 10 Public Research Centers, 5 Universities (La Sapienza, Tor Vergata and La Terza Università in Rome plus Cassino and Viterbo) and 4 Aerospace Engineering faculties in the Lazio region in the development of the project
- GTR will support the Galileo R&D projects funded by National and European budget with a common reference facility with trustable and professional tools



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