PEGASUS

PEGASUS is a toolset which allows analysis of GNSS data collected from different SBAS and GBAS systems implementing the algorithms issued in the MOPS documents. This set of tools is designed to assist Air Navigation Service providers and users in evaluating the performances of satellite navigation Signals-in-Space and their augmentation. The tool provides several functionalities such as computation of position simulating MOPS-compliant receivers and determination of GNSS augmentation attributes like accuracy, integrity, computation of trajectory errors, prediction of continuity and availability and simulation of GBAS Ground Station processing algorithms.

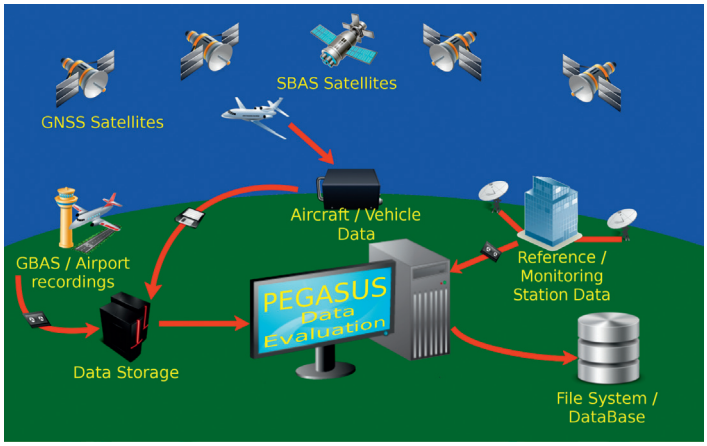
Since 2003, modules with GBAS ground and airborne algorithms and graphs are integrated in PEGASUS in order to support GBAS data processing needs and activities. The GBAS modules allow ground station processing and error simulation as well as investigation into the characteristics of the VDB data link standard compliance. Moreover, it assists Air Traffic Service Providers with analysis to aid site approval and to perform the verifications prerequisite for obtaining operational approval of a GBAS installation from their respective safety regulation authorities. The modules are currently supporting single frequency, single GPS only functionality, CAT-I and CAT-II/III precision approaches but are foreseen to be extended to support multi-constellation, and multi-frequency systems such as GALILEO. In the context of SESAR, the PEGASUS toolset is intensively used by the GBAS CAT-II/III precision approach work package partners.

Furthermore, the PEGASUS toolset is the core component of the EGNOS Data Collection Network, which provides SBAS APV-1 and LPV-200 approach independent performance monitoring and support to the European Commission.

Objective:

PEGASUS is providing results supporting:

- Validation of ICAO, RTCA and EUROCAE GNSS Standards;
- State campaigns to validate GNSS performance to support local regulatory activities;
- Exchange of comparable results for faster accumulation of relevant statistical data;
- Manufacturer-independent verification of augmentation system performance.

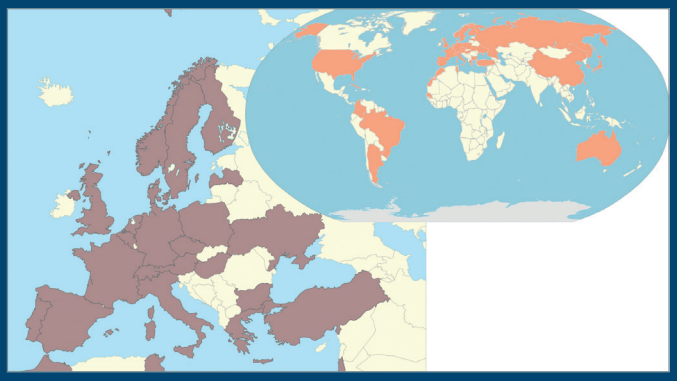


The PEGASUS tool provides:

- Processing according to published standards (compliancy with standards is validated);
- Simplified, automated processing;
- Scheduling of Processing;
- Traceability of parameters and configurations used;
- Manufacturer independence;
- Modularity, standard, open interfaces;
- Adaptability to standards changes;
- Automated provision of relevant graphs;
- Support for users of varying needs;
- Full documentation and tutorials for often-used functions;
- Development in close co-operation with users.

PEGASUS users:

- ANSP's, manufacturers and universities all over ECAC;
- Research institutes and companies all over the world.

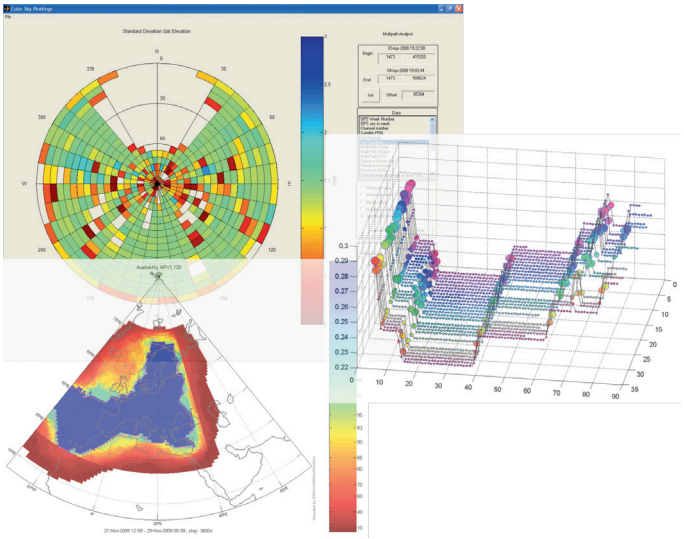


Parameters evaluated:

- Satellite orbit information;
- GNSS raw and computed measurement data;
- SBAS data messages;
- GBAS data messages;
- GBAS ground station and error parameters;
- Performance-relevant parameters typically recorded onboard an aircraft, including INS, Hybrid data, Air data, ILS data;
- Input of truth track information.

Main functionalities:

- Data plausibility checking;
- SBAS/GBAS GAST-C/D message content distribution;
- SBAS/GBAS message data analysis;
- Static and dynamic performance evaluation;
- Data integrity analysis;
- Air data calculations;
- Statistics accumulation;
- Multipath investigation;
- Spatial extrapolation of augmentation system performance and performance prediction;
- Aircraft Dynamics corrections and translation of data to a common navigation reference point;
- Graphical CSV data file viewer;
- Generic data viewers and predetermined GNSS-specific performance analysis graphs.



For further information about PEGASUS, please contact:

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or visit our website:

http://www.eurocontrol.int/articles/activities#cns

Glossary

EGNOS European Geostationary Overlay System
EUROCAE European Organization for Civil Aviation Equipment
GAST GBAS Approach Service Type
GBAS Ground Based Augmentation System
GNSS Global Navigation Satellite System
GPS Global Positioning System
ICAO International Civil Aviation Organisation
ILS Instrument Landing System
INS Inertial Navigation System
MOPS Minimum Operational Standards
SBAS Space-Based Augmentation System
SESAR Single European Sky ATM Research
RAIM Receiver Autonomous Integrity Monitoring