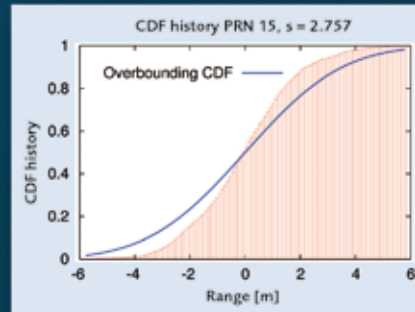
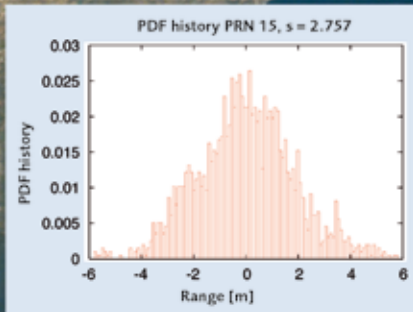
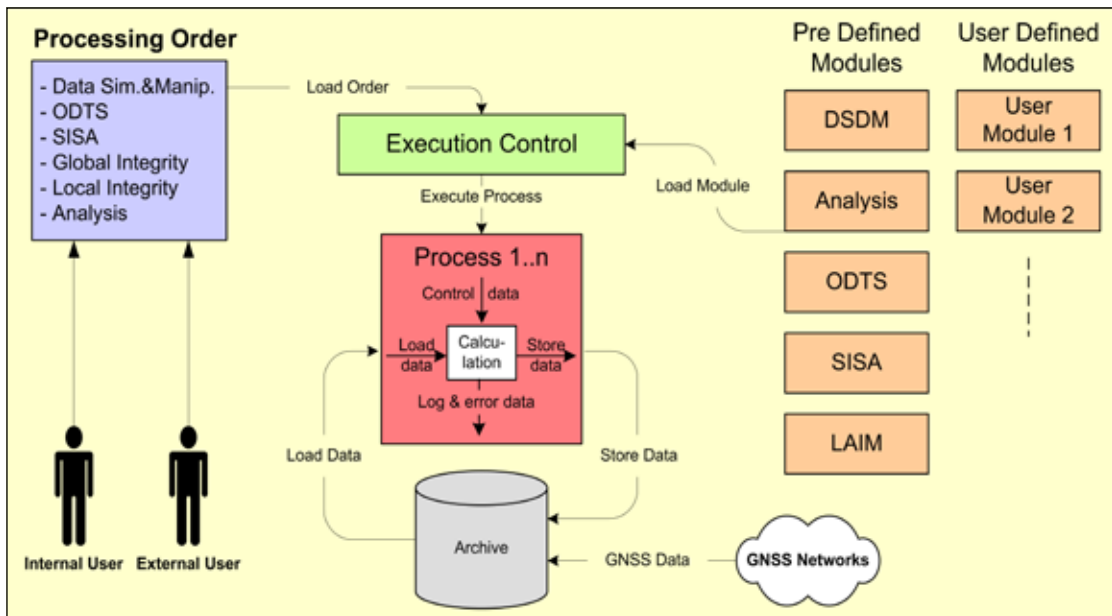




The Probability Density Function (PDF) of Signal in Space Error and Cumulative Distribution Function (CDF) with a Gaussian Overbounding for GPS PRN 15 (60 days of data).



BayPAF - a performance assessment facility for operators and providers of GNSS related services and data. BayPAF provides high performance functionalities for GNSS data acquisition, processing, analysis and product generation.



Simplified architecture of and processing flow within the BayNavTech Performance Assessment Facility.

Module Specification

ODTs: GNSS Processing Products:

- Predicted and post-processed precise satellite orbits and clocks for GPS and Galileo*.
- Orbit/Clock Accuracy:
 - 50cm/1.5ns after 6h prediction
 - 10cm/0.3ns for post processed products
- Further Products: Satellite problem and manoeuvre announcements, satellite signal biases, Earth rotation parameters, atmospheric characteristics, station problems, station coordinates etc.

DSDM: Data Simulation / Data Manipulation:

- Simulation of GNSS observations (range, phase, Doppler, signal strength) for up to 50 sensor stations and full Galileo* and GPS constellations.
- Models for ionosphere, troposphere, multipath, scintillation, interference
- Manipulation of available (i.e. real) data
- Application of Galileo* Feared Events
- Reproducibility of reality: better than 1m.

Analysis:

- Quality check of generated orbit and clock products against internal or external references.

SISA: Signal in Space Accuracy:

- Computation of GPS and Galileo* Signal in Space Accuracy (SISA) according to Galileo* specification based on historic values of SISE (Signal in Space Error)
- Two different concepts to compute the SISA overbounding for the SISE distribution are available

LAIM: Local Augmentation and Integrity Module:

- Real-time processing of local GNSS networks to generate augmentation data for professional users. The processing includes:
 - Preprocessing of observations with cycle-slip detection and correction, multipath and station problem detection, ionosphere and troposphere correction, code-carrier smoothing.
 - Network-based determination of corrections for GNSS data.
 - Integrity computation of correction data.
- Provision of corrections to the user via generic Area Correction Parameters (e.g. FKP) or user specific corrections similar to Virtual Reference Data (VRS).

General

Archive:

- Autonomous data retrieval from different GNSS networks.
- Archiving of a variety of products and analyses.

Hardware:

- Linux PC cluster
 - 1 server, scaleable number of processing clients
- Automatic processing load balancing
- Redundant data archive: 3.2TB, fully backed up

Typical BayPAF Investigations

- Determination of precise satellite orbits and clocks for GPS and Galileo* and comparison with navigation messages
- Investigation of Galileo* Feared Events
- Characterisation of local and regional GNSS networks

(*) Galileo is a trademark of the European Commission and the space programme Galileo is a joint initiative of the European Commission and the European Space Agency