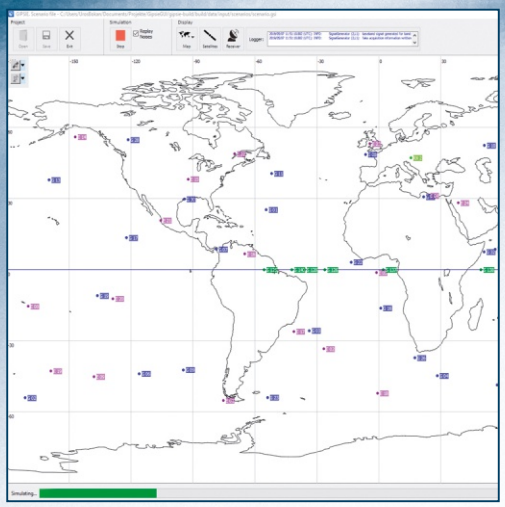
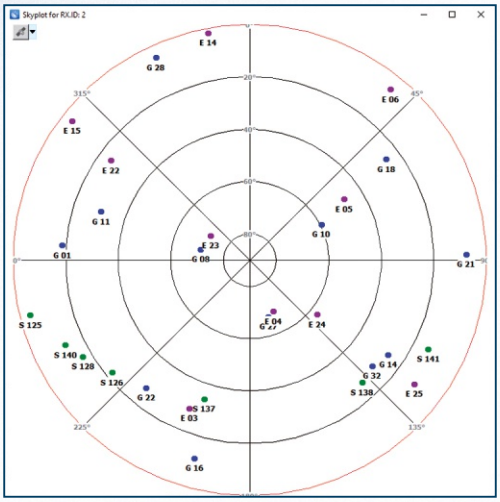




GIPSIE

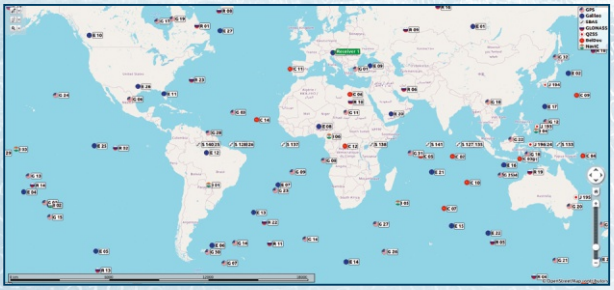
GNSS Multisystem Performance Simulation Environment

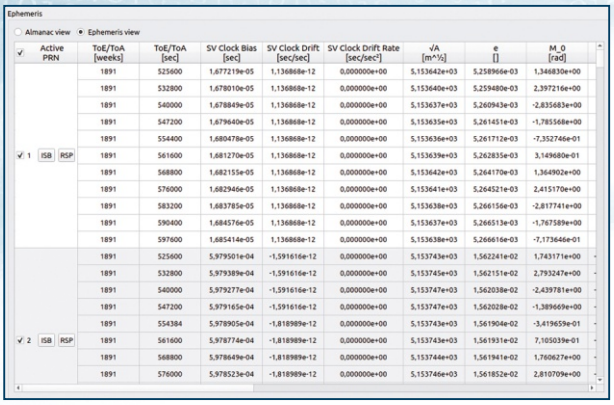
OHB Digital Solutions GmbH develops systems for simulating various GNSS constellations and signals including several degradation effects and disturbances.

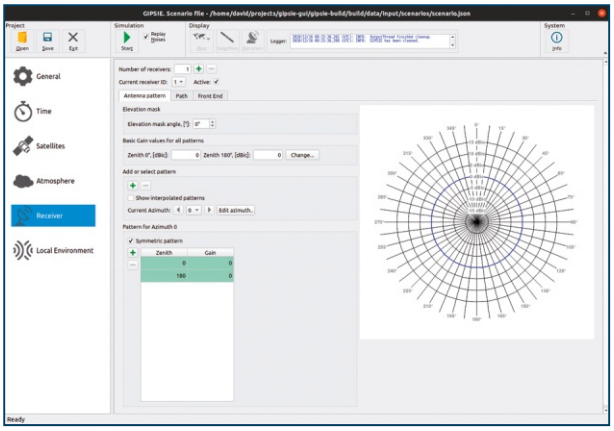
GIPSIE simulates arbitrary satellite orbits using a sophisticated orbit integrator and is able to model all error sources, delays and propagation effects. These include various models for satellite clocks, ionosphere and troposphere, multipath, signal power, antenna patterns and noise.
In addition, multiple types of signal interference, like jamming and spoofing, can be defined. Customized navigation message formats and contents can be used to simulate future GNSS signal features. The IF signal simulation is based on various settings for simulation of a user-defined radio-frequency front-end.

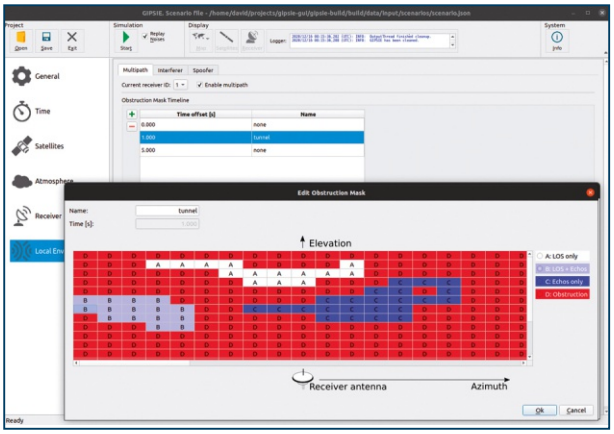
GIPSIE

GNSS Multisystem Performance Simulation Environment









GIPSIE is a highly flexible and powerful GNSS simulation environment that provides the possibility to generate simulated GNSS constellations and IF signals for various user-defined scenarios including complex trajectories and environments. All settings can be made within the user-friendly and intuitive graphical user interface or within an easy-to-read configuration file.

The simulated signals can be used for evaluation of SDR receivers and GNSS applications and – in combination with a suitable RF signal generator – the evaluation of any hardware-based GNSS receiver is possible as well.

The system is composed of the following software modules:

- Orbit integration module based on earth gravitational model including gravitational effects of sun and moon
- Simulation of complete GNSS constellations including all satellites based on default almanac or accurate ephemeris information and clock parameters
- Simulation of accurate atmospheric models for ionospheric and tropospheric delays
- Simulation of user-defined receiver antenna characteristics including reception gain patterns and multipath effects
- Navigation message simulation based on GNSS ICDs or customized user-defined message formats
- IF signal simulation based on the constellation updates with user-defined update rate and bandwidth
- 100% reproducible noise and signal degradation simulations
- Graphical user interface
- Comprehensive data logging of all intermediate results for detailed analyses and debugging support

Key performance characteristics:

- Satellite signals:
  - GPS: L1 C/A, L2C, L5
  - Galileo: E1 B/C, E5a-I/Q, E5b-I/Q
  - GLONASS: G1 C/A, G2 C/A
  - BeiDou: B1, B2
  - SBAS: L1 C/A
- Bandwidth: up to 100 MHz
- Constellation Update Rate: up to 1000 Hz
- Resolution: up to 2x16 bit (complex I/Q)

GIPSIE is a flexible and scalable GNSS IF Signal Simulator with accurate modelling and simulation of various degradation effects and extensions for analysis of intentional interference.

OHB Digital Solutions GmbH
www.ohb-digital.at

Rettenbacher Straße 22, 8044 Graz, Austria
T: +43-316-890971 M: info@ohb-digital.at