GNSS Modeling and Simulation

CAST NAVIGATION

Produce Precise and Repeatable GNSS RF Signals

System Features

- Provides precise and repeatable GNSS RF signals that can be utilized for testing in a laboratory or field-type environment
- Signal types supported: GPS, BeiDou GLONASS, SBAS
- Systems are capable of simulating either static or dynamic motion for terrestrial, aquatic, airborne and space-based vehicles
- Customizable solutions allow configurations of GNSS signals to meet your requirements
- Incorporates years of development, testing, and refinement of the precise GNSS/INS synchronization capability needed for simulation of aircraft dynamics

Multi-Constellation GNSS RF Signal Generation Technology

CAST Navigation's GNSS simulation systems produce GNSS RF signals that provide a precise and repeatable testing signal, perfect for use either in the field or in the laboratory environment. These systems can be used for a wide range of testing and integration verification applications and they are an ideal choice for stimulating military or commercial devices where only GNSS signals are needed. Our simulators are powered by proprietary multi-frequency, multi-constellation GNSS RF signal generation technology. This technology provides you with highly accurate and fully programmable signals along with advanced vehicle trajectory capabilities allowing you to custom tailor parameters and trajectories to meet your simulation requirements. The CAST-GNSS simulators can be configured to deliver a full constellation of GNSS satellites, with up to 16 satellites in view per GNSS satellite constellation signal type, per composite signal RF output element. CAST GNSS systems can be configured to simultaneously provide up to five different constellation types such as GPS (including Y-Code, SAASM, M-Code AES and MNSA), Beidou, and Glonass on each antenna element.

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System Specifications

Output Signal Types

GPS: L1, L2, L2C, L5, C/A-Code, P-Code,Y-Code, SAASM, M-Code AES, M-Code MNSA
BeiDou: BDS-B1L, BDS-B1C
GLONASS: L1, L2
SBAS: WAAS, EGNOS, MSAS, GAGAN

Maximum Dynamics

Velocity:	> 60,000 m/s
Acceleration:	± 150,000 m/s^2
Jerk:	± 150,000 m/s^3

Signal Output Levels (Nominal)

GPS:	-160 dBW
GLONASS:	-161 dBW
Beidou:	-163 dBW
SBAS :	-160 dBW

Signal Level Control

Range:	± 30 dB
Resolution:	0.1 dB

L1/L2 Differential Delay

Range:	± 0.3 m
Resolution:	< 1 mm

Signal Accuracy

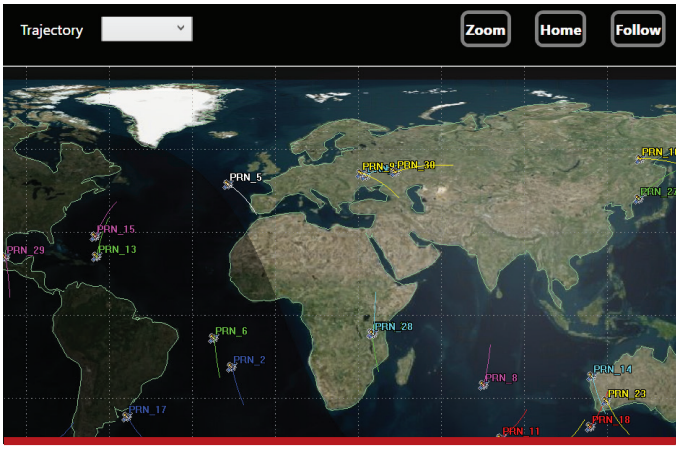
Pseudorange:	1 mm
Pseudorange:	Rate 1 mm/s
Delta Pseudorange:	1 mm
Interchannel Bias:	< 1 mm
Uncontrolled Bias:	< 1 mm
Bias Repeatability (initial):	< 1 mm
Bias Stability (operational):	< 1 mm

Signal Quality

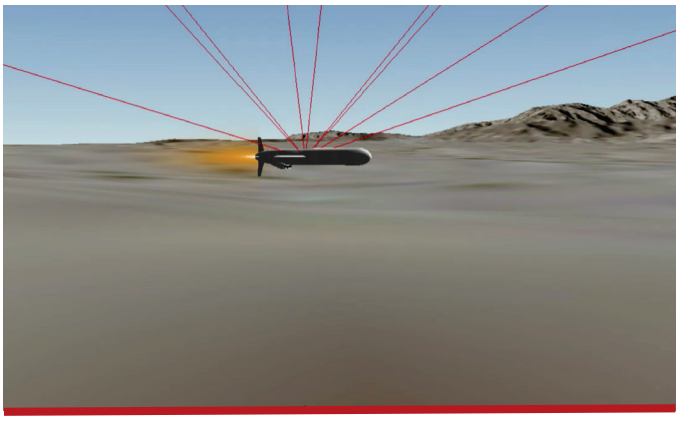
Spurious:	< -45 dBc
Harmonics:	< -50 dBc
Reference Oscillator:	10MHz OCXO
Frequency Stability:	3x10^{-9} per day

System Options

6-DOF Real Time Interface
Y-Code, SAASM, MNSA
L2C, L5
L2C
L5
Remote Control DLL
Jamming
Additional Elements
Inertial Interface
Avionics Interfaces



View of available GPS satellites in the simulation and their locations above the earth.



3D simulation view of JDAM missle.

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