

SATNAV Toolbox

Satellite Navigation Toolbox for MATLAB by GPSofT.

GPSofT has applied the power of MATLAB to GNSS. The SatNav Toolbox is a unique collection of M-files which allows for total system emulation.

The SatNav Toolbox simulates not only satellites and receivers, but also the propagation channels. Error sources such as thermal noise, multipath, atmospheric delays and Selective Availability are modeled as an integral part of pseudorange (i.e., code-phase) and integrated Doppler (i.e., carrier-phase) emulation. Furthermore, the errors are generated such that the proper temporal and spatial decorrelation effects are observed in the measurements. This allows for realistic modeling of both code-phase DGPS and carrier phase DGPS (i.e., kinematic) in addition to the usual stand-alone positioning algorithms.

Version 3 of the SatNav Toolbox adds RINEX (receiver independent exchange format) data file processing to its simulation and analysis power. In addition, many of the demo programs have been updated to include simulation Galileo, WAAS and EGNOS.

All routines are provided as M-files thus allowing the user full access to the code and the ability to modify to suit one's needs. Full documentation is provided through an extensive user manual as well as through the MATLAB HELP command. The SatNav Toolbox is easy to use (ideal for educational purposes, yet powerful for the seasoned GNSS engineer). In addition to the product itself, GPSofT provides to all registered users, two years of technical support at no additional cost. **The SATNAV Toolbox is compatible with MATLAB 6.0**

Features

NEW in v 3.0! *Real data file processing through RINEX support*

Emulation of Galileo, GEOs, GPS and GPS Modernization (C/A-code on L2 and L5) as well as dual-frequency P-code measurements. The user can also emulate signals on additional carrier frequencies defined by the user.

Satellite constellation emulator (supports GPS and Glonass as well as user-defined constellations). In addition to ideal circular orbits, YUMA-format broadcast almanacs can be used.

Emulation of C/A and P-code pseudorange and integrated doppler on user definable civil and military carrier frequencies. (thermal noise, ionospheric and tropospheric delay, diffuse multipath)

Carrier-smoothing (via Hatch filter or Complementary Kalman filter)

Coordinate conversion routines

Trajectory generator to emulate vehicle motion

Calculation of DOP's, Satellite visibility (skyplots)

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