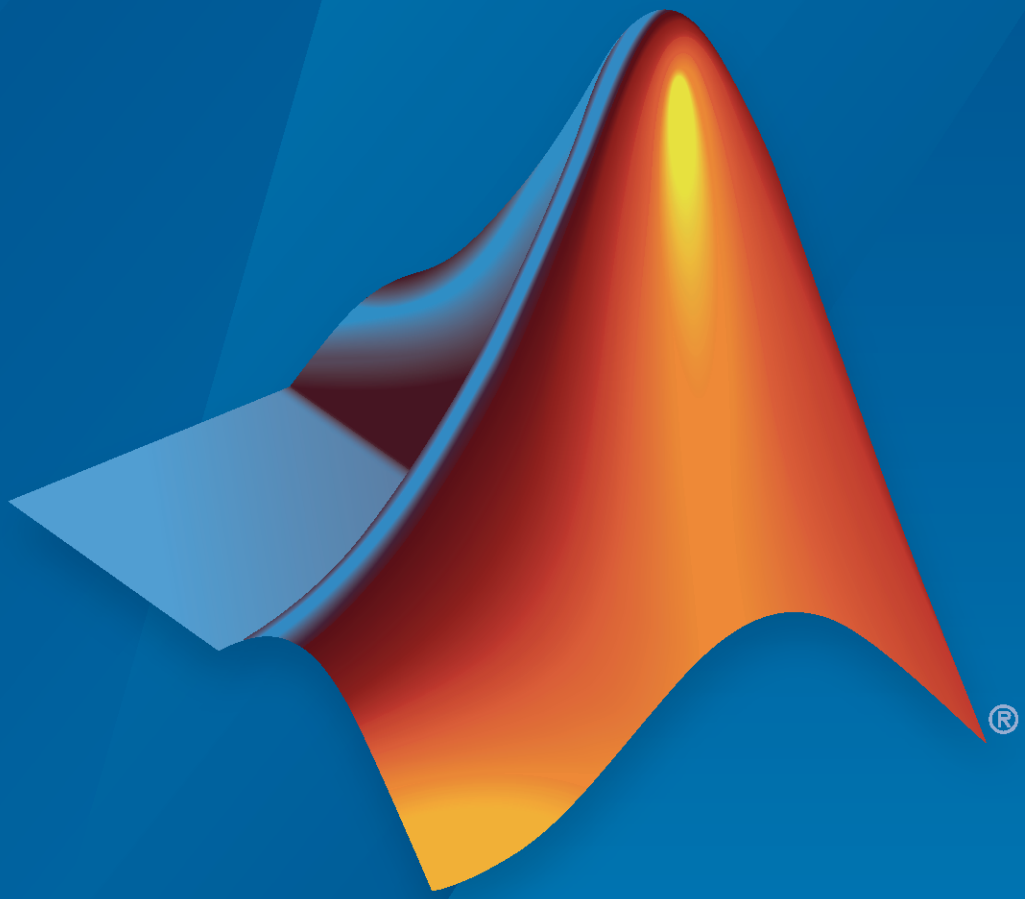
Satellite Communications Toolbox Release Notes



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New Features

Introducing Satellite Communications Toolbox

Satellite Communications Toolbox provides standards-based tools for designing, simulating, and verifying satellite communications systems and links. The toolbox enables you to model and visualize satellite orbits and perform link analysis and access calculations. You can also design physical layer algorithms together with RF components and ground station receivers, generate test waveforms, and perform golden reference design verification.

With the toolbox you can configure, simulate, measure, and analyze end-to-end satellite communications links. You can also create and reuse tests to verify that your designs, prototypes, and implementations comply with satellite communications and navigations standards, including DVB-S2X, DVB-S2, CCSDS, and GPS.

Satellite Scenario: Simulate, analyze, and visualize satellites in orbit

Use functions and reference examples that enable you to simulate, analyze, and visualize satellites in orbits. Use the `satelliteScenario` object to:

- Define satellites and their orbits.
- Define ground stations.
- Visualize satellites in orbit and ground tracks.
- Visualize satellite field-of-view on Earth.
- Analyze line-of-sight access between satellites and ground stations.
- Analyze the closure of communications links between satellites and ground stations.
- View a satellite scenario with playback animation.

For more information, see “Satellite Scenario Basics” and “Scenario Generation and Visualization”.

Satellite link budget analysis

Use the **Satellite Link Budget Analyzer** app to analyze, design, and visualize the link budget for satellite communications. For more information, see “Link Budget Analysis”.

Standards-based waveform generation

Use standards-based functions and reference examples to design, model, and verify satellite communications and navigation systems. The toolbox offers these standards-based waveforms:

- Consultative Committee for Space Data Systems (CCSDS) Telecommand (TC)
- CCSDS Telemetry (TM)
- Digital Video Broadcasting Satellite Second Generation (DVB-S2)
- Digital Video Broadcasting Satellite Second Generation extended (DVB-S2X)
- Global Positioning System (GPS)

For more information, see “Generate Waveforms” and “Signal Transmission”.

Channel models and RF propagation loss

Use ITU-R P.618 functions to design Earth-space links by calculating the signal propagation loss through the atmosphere. With these toolbox features, you can also model and visualize noisy single input single output (SISO) channels that have Rician or Land Mobile Satellite (LMS) fading profiles. For more information, see “RF Propagation and Channel Models”.

Signal recovery

Use receiver functions to decode and demodulate waveforms. Use reference examples to model end-to-end communications links and analyze link performance. For more information, see “End-to-End Simulation”.

C and C++ code generation support

Satellite Communications Toolbox supports ANSI®/ISO® compliant C/C++ code generation. For an alphabetized list of features that support C/C++ code generation, see Satellite Communications Toolbox – Functions and Objects Filtered by C/C++ Code Generation.