FLEXSAR

Agile Adaptive Radar

The Space Dynamics Laboratory's (SDL) FlexSAR is a powerful, flight-proven intelligence, surveillance, and reconnaissance asset. Regardless of weather or time of day, this airborne radar system's outstanding geometric accuracy and precise scene measurements provide rapid, reliable imagery, including the following:

- Bistatic collection using communication-free synchronization between platforms
- High-resolution & high-signal-to-noise ratio imagery
- Geographically referenced imagery
- Moving target identification & recognition
- 3D reconstruction of scenes

FlexSAR is a low-cost imaging system built on an extensible radio frequency (RF) architecture and supported by software-defined radio for waveform generation and sampling. This system has extensive waveform, timing, and pointing flexibility. The FlexSAR system is easily modified to accommodate new capabilities and/or changing conditions, with modification timelines measured in weeks rather than years.

The FlexSAR system.

Quad-polarized Ku-band FlexSAR image.

FEATURES

- Agile RF & processing system
- Rapid & simple configurability
- High-quality connectorized RF for cost-effective modifications
- High-fidelity radar data with carefully designed data paths for signal integrity
- Quick, efficient validation & test of novel radar modalities
- Raw data open access in standard formats
- Fine-tuned processing & access to intermediate products
- Flight-proven, reliable performance

SPECIFICATIONS

- 2 transmit (TX), 4 receive (RX), configurable multiple input, multiple output (MIMO) channels
- Full pulse-to-pulse waveform agility
- Capable of mutually coherent bands with simultaneous TX/RX
- Supports L-band, C-band, X-band & Ku-band
- Configurable sampling
  - Supports pulsed & continuous TX & RX modes
  - Supports up to 3.2 GB/sec RX & 4.8 GB/sec TX per channel
- 2.5 GB/sec raw data storage to 8 TB storage
- Centimeter-accurate navigation solutions
- Strip & spot modes
- Miniaturized version for UAS
- Paired with a two-axis gimbal for stabilized pointing

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SDL/15-329 Rev. D

FLIGHT TESTING SERVICES

SDL is uniquely positioned to support radar data collections and provide flight test support, with flight assets that include manned and unmanned aircraft, support facilities, and ready access to several test range sites. SDL also offers a full array of flight test resources and services, such as pilots, operators, sensor integration, and FAA certification, for reasonable hourly rates.

SDL's aircraft can be configured to support various power, processing, and communications requirements, including tactical data links.

(2) Cessna Skymaster O-2 manned aircraft can carry a total payload of up to 450 lbs and 2 kW. It features 22 U of rack space, four wing hardpoints for sensor installation, and inline twin engines for very stable flight. GPS/INS is available.

The SDL-developed hexcopter can carry a payload of up to 14.75 lbs while supplying 250 W for 42 minutes under the FAA's Small UAS Rule (Part 107). It is capable of fully autonomous missions and features a large mounting surface, dedicated power supply, and space for electronics within the fuselage. GPS/INS data is available.

APPLICATIONS

- Synthetic aperture radar (SAR)
- Ground moving target indicator (GMTI)
- Along-track interferometry (ATI)
- Moving target recognition (MTR)
- 3D scenery construction
- Monostatic or multistatic geometries
- Active or passive modalities
- Dismount detection
- Video SAR
- Polarimetric imaging

SDL Skymaster aircraft with FlexSAR.

SDL-developed hexcopters flying at a test location.