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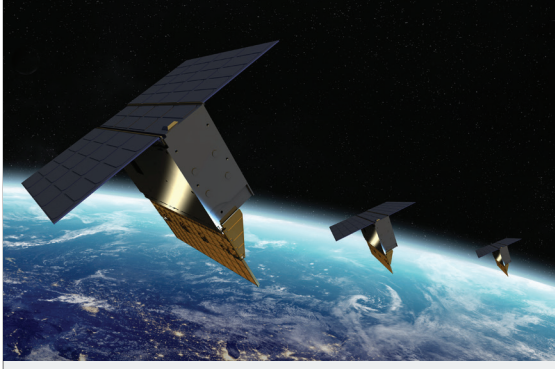


HYPERCUBE™ INFRARED SOUNDING AND 3D WIND MEASUREMENT

Detailed atmospheric data with proven hyperspectral technology in smallsat size

Hyperspectral infrared sounders, which use thousands of spectral channels to make detailed measurements of temperature and moisture, are one of the top contributors to weather forecast accuracy. With HyperCube, L3Harris has miniaturized its proven hyperspectral sensor technology to meet future requirements for sounding and 3D wind data.

SOUNDING WITH SMALLSATS

Detailed temperature, moisture and wind information at many levels of the atmosphere are considered a top priority for maintaining and improving the accuracy of weather forecasting models. L3Harris provides HyperCube, a high-performance, cost-effective solution.

HyperCube is designed to measure vertical profiles of temperature and moisture, and the speed, direction and elevation of winds in the atmosphere. Being a Fourier transform spectrometer, the HyperCube is much smaller, less expensive and easier to implement than complex Light Detection and Ranging (LiDAR) wind measurement programs.

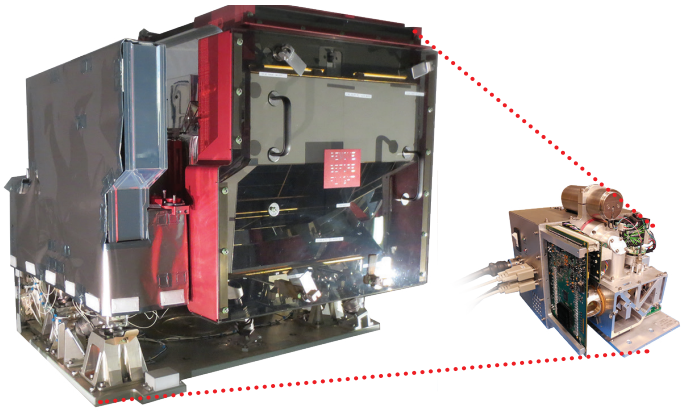
PRECISE, ABSOLUTE CALIBRATION

Enabled by proven L3Harris sounding technology, HyperCube uses more than 600 hyperspectral infrared channels to provide temperature, moisture and wind measurements at more than 30 layers of the atmosphere at a fraction of the size of previous instruments.

An onboard target capable of precise, absolute calibration maintains data accuracy. HyperCube also offers collection time flexibility, allowing for more mission coverage than alternative technologies.

FLEXIBLE SOLUTION

Because HyperCube combines small size and low cost with the latest developments in hyperspectral sounding, its technology meets a wide range of mission requirements. HyperCube technology can be easily configured for multiple missions and applications including weather, agriculture, and oil and gas.



HyperCube (right) uses technology from the proven L3Harris CrIS instrument (left) miniaturized to a smallsat size

BENEFITS

- **Provides detailed temperature, moisture and wind data at many levels of the atmosphere**
- **Improves weather forecasting model accuracy and lead time**
- **Results in better temperature, moisture and wind data from within the lower atmosphere**
- **Enhances severe weather forecasts and warnings**
- **Configures for multiple missions and applications including weather, agriculture, and oil and gas**

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HyperCube sounding and 3D winds

The design of HyperCube improves upon the highly successful Cross-track Infrared Sounder (CrIS) aboard the National Oceanic and Atmospheric Administration's (NOAA) Joint Polar Satellite System (JPSS). CrIS, also a Fourier transform spectrometer, is one of the top contributors to weather forecast accuracy. L3Harris packages this proven technology in a smaller, lighter-weight solution.

HYPERCUBE 3D WINDS

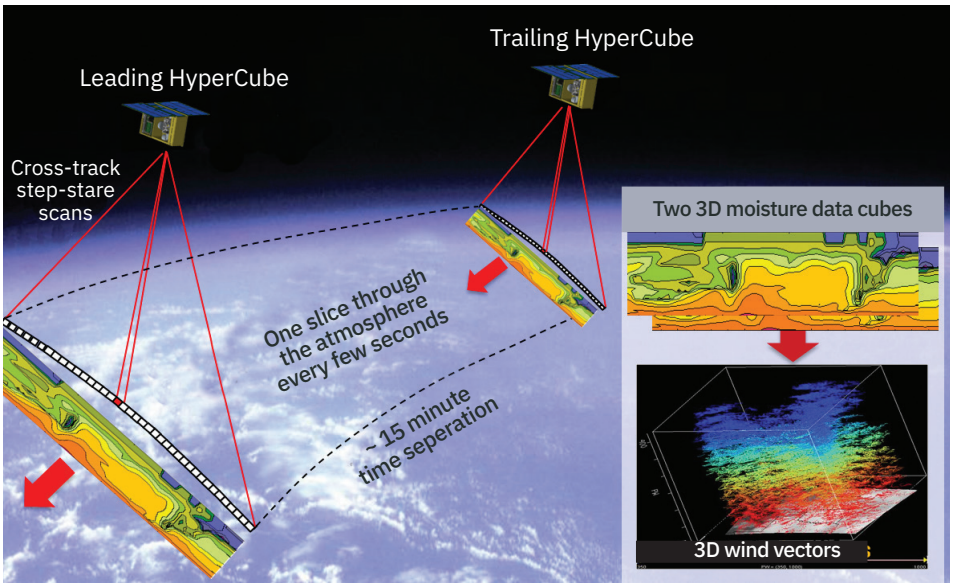
Multiple HyperCubes flying over the same area in succession provide detailed measurements of wind speed and direction at many levels of the atmosphere. Changes in the moisture field from one HyperCube to the next can be used to derive a 3D view of wind speed and direction in the atmosphere. As the number of HyperCubes on orbit increases, so does the frequency of global coverage of 3D wind measurements.

KEY COMPONENTS

Scanner: Consists of two mirrors that work together to reflect infrared light from the atmosphere toward the interferometer, resulting in greater efficiency and with fewer data gaps than with one mirror. The HyperCube scanner is a miniature version of the two-mirror scanner used by the L3Harris Advanced Baseline Imager on NOAA's Geostationary Operational Environmental Satellite-R (GOES-R) Series weather satellites.

Interferometer: Consists of a laser, a series of mirrors, and a light sensor — detecting more than 600 channels of infrared light from the atmosphere to precisely measure temperature and moisture at more than 30 levels of the atmosphere. The HyperCube interferometer is a miniature version of the interferometer used by the CrIS instrument.

Focal Plane Array (FPA): Consists of a 6-by-6 or 25-by-25 pixel array that converts the infrared light into a digital signal.



HYPERCUBE FEATURES

- More than 600 channels
- 5-10 kilometer ground sample distance
- 6-by-6 or 25-by-25 pixel Focal Plane Array
- Two-stage or four-stage passive cooler

WIND VECTOR CHARACTERISTICS

- 2-3 meters per second accuracy
- 30-plus vertical layer density

HyperCube 3D Wind Measurement

L3Harris Technologies is an agile global aerospace and defense technology innovator, delivering end-to-end solutions that meet customers' mission-critical needs. The company provides advanced defense and commercial technologies across air, land, sea, space and cyber domains.

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