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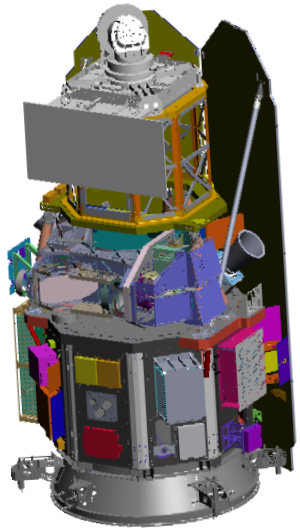
Fact Sheet

Near Field InfraRed Experiment (NFIRE)



The Near Field Infrared Experiment (NFIRE) technology project is operated by the Missile Defense Agency (MDA) from the Missile Defense Space Development Center at Schriever AFB, Colo. The satellite's primary mission is to collect near-field phenomenology data for use in plume-to-hard body handover algorithms, navigation, guidance and control, and endgame homing algorithms for boost-phase interceptor programs. MDA uses this data to validate the models and simulations that are fundamental to developing the guidance and homing algorithms. The secondary mission uses a commercial off-the-shelf Laser Communications Terminal (LCT) to conduct laser communication proof-of-concept experiments. The LCT conducts these experiments with the German Terra SAR-X satellite and the Optical Ground System. These experiments test low-earth orbit satellite-to-satellite, satellite-to-aircraft, and satellite-to-ground communication capabilities by providing an extremely high data rate at a low cost. Additionally, the LCT provides a highly secure communications link with an extremely low-probability-of-intercept as compared with other communication techniques.

Overview

- Low-earth orbiting satellite (425x425km) at a 48-degree inclination with a 90-minute orbital period
- An experimental satellite with two payloads
  - Track Sensor Payload (TSP) consisting of three cameras: Short/Mid-Wave Infrared, Long-Wave Infrared, and Visible cameras
  - German made Commercial Off-The-Shelf (COTS) Laser Communication Terminal (LCT)
- The NFIRE program has executed more than 525 experiments with an overall operational success rate greater than 98%
- LCT experiments assess viability of satellite-to-satellite links with Terra SAR-X satellite transferring 4,405.89 seconds of total communications. Each 6.1 seconds of data is equivalent to a DVD`s (4.6GB) worth of data

Program Outlook

- Execute environmental background characterization (regional/seasonal atmospheric radiance variability, day-night, land-sea, clouds, auroral measurements, etc.) for Precision Tracking Space System sensor and SM-3 IIB seeker development programs by collecting earth limb background, clutter, and radiance measurements, and target signatures for modeling and algorithm development.
- Re-programmed NFIRE to perform hyper-temporal short wave infrared collections at a new frame rate to support research and development of early launch detection and tracking capabilities. This capability will demonstrate early missile launch detection through sunlit clouds that will support improvement of environmental models.
- Continue low-earth orbit satellite-to-satellite, satellite-to-aircraft, and satellite-to-ground laser communication experiments to characterize global atmospheric effects on laser communications.