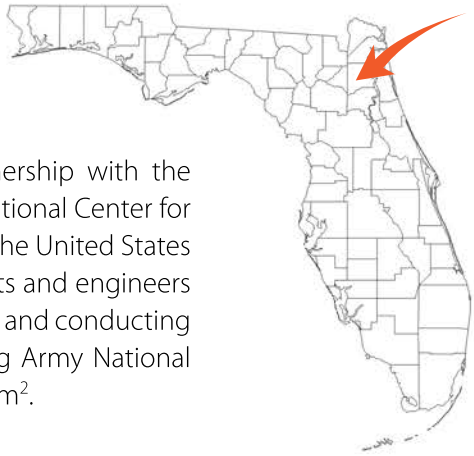
ROCKET-TRIGGERED LIGHTNING TESTING

ICLRT, CAMP BLANDING, FL

SLS SCIENTIFIC LIGHTNING SOLUTIONS, LLC

SLS + ICLRT



Scientific Lightning Solutions, LLC (SLS) has established an exclusive partnership with the University of Florida to conduct real lightning testing operations at the International Center for Lightning Research and Testing (ICLRT), the only triggered lightning facility in the United States where commercial real lightning experiments can be performed. SLS scientists and engineers possess more than 30 years of combined expertise in designing, implementing, and conducting triggered lightning experiments. The ICLRT is located on the Camp Blanding Army National Guard base east of Starke, Florida and occupies a secure land area of about 1 km^2.

TRIGGERED LIGHTNING

Lightning is triggered at the ICLRT using the classical rocket-and-wire technique. The triggered lightning process involves launching a small rocket trailing a grounded wire into a region of high overhead charge density. Following an initial period of long-duration current flow that establishes a plasma-channel between the concentrated charge aloft and ground, real lightning leader/return stroke sequences traverse the pre-conditioned path to ground. Triggered lightning provides the unique capability of accurately controlling the strike points of lightning return strokes. These real lightning currents can be injected directly into precise locations on a given test article. Test articles can also be subjected to the indirect effects of lightning, with the distance between the test article and the lightning channel accurately controlled.

CHARACTERISTICS

Triggered lightning provides the ability to subject test articles to different real lightning phenomena. During a single triggered lightning discharge, a test article will experience a large variability of currents, ranging from low-amplitude, long duration currents, moderate-amplitude and rise-time current pulses, to fast-rising, high-amplitude transients. SLS designs custom experiments to control how a test-article is exposed to the direct and indirect effects of real lightning currents, voltages, and electromagnetic fields.

SLS is now offering this unique, one-of-a-kind real lightning testing capability to private industry for the first time.

CONTACT US TODAY

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TESTING CAPABILITIES

TEST CONFIGURATIONS

SLS designs and implements triggered lightning experiments based on individual customer requirements. Test-articles can be subjected to direct lightning attachment, controlled-length arc attachment, direct current injection, or can be monitored for the indirect effects of lightning.

EXPERIMENT SIZE

The SLS triggered lightning facility at the ICLRT can accommodate experimental systems ranging in size from individual electronic components to fully-assembled aircraft. SLS provides the infrastructure to test and characterize the responses of complex lightning protection and grounding systems, power distribution and generation systems, and green energy products to the direct and indirect effects of real lightning. SLS delivers real lightning testing solutions that were not previously feasible via high-voltage laboratory testing.

INDUSTRIES SERVED

- Green energy
- Oil and natural gas
- Aerospace
- Communications
- Power generation and distribution
- Lightning protection and shielding
- Military and defense

Lightning instrumentation and high-speed cameras installed at Kennedy Space Center

INSTRUMENTATION

SLS provides state-of- the-art digitization systems and sensors for monitoring the electromagnetic and optical emissions of triggered lightning. The digitization systems and sensors have been rigorously tested and qualified both at the ICLRT and at NASA's Kennedy Space Center (KSC) since 2008, and are presently being used to monitor the lightning environment at Launch Complex 39B, the next generation launch facility at KSC for NASA's new Space Launch System rocket. SLS implements customized direct and induced current and voltage measurements for a test article, or alternately, the outputs of customer-supplied sensors or test points can be digitized. SLS also supplies custom, high-bandwidth electromagnetic field sensors for measuring electric and magnetic fields and their derivatives. Finally, SLS provides support for measurements of the mechanical properties of a test article exposed to the direct and indirect effects of triggered lightning (e.g., temperature, displacement, vibration, etc.). The triggering facilities are equipped with high-speed cameras that are used to closely monitor the test article per customer requirements.

Lightning instrumentation installed at Launch Complex 39B, Kennedy Space Center

THE TRIGGERED LIGHTNING ADVANTAGE

Currently, most components and assemblies that are susceptible to the direct and indirect effects of lightning are tested and qualified in high voltage laboratories. Laboratory surge generators are typically designed to supply outputs that mimic either the high voltage or high current present during a lightning discharge. A single surge generator does not exist that can simultaneously supply both realistic lightning high voltage and high current to a test article. Triggered lightning provides this capability for products ranging from individual components to complex, full-scale integrated systems.

When SLS characterizes a test article's response and susceptibility to triggered lightning, followed by the development of comprehensive mitigation strategies, the test article's performance in a real lightning environment is ensured. Products that have undergone triggered lightning testing have an exclusive advantage in the marketplace.

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