



Photo Credit: Publicdomainpictures.net/Vera Kratochvil

Sensors

Lightning Mitigation and Damage Detection

For wind turbines and other tall structures

NASA's Langley Research Center has developed a patented SansEC Sensor Technology for use in many different areas, including tall structures and wind turbines.

The SansEC technology is a proven wireless sensing platform capable of measuring the electrical impedance of physical matter in proximity to the sensor based on a change in its resonance response. The SansEC sensor also exhibits a unique characteristic to disperse the lightning strike current to help mitigate lightning damage. In a turbine blade application, an array of SansEC sensors will cover the surface area of the composite blade, providing both lightning mitigation and damage sensing.

NASA Langley Research Center is seeking industrial partners/licenseses to commercialize this technology. The research team at NASA Langley is available to assist with further development.

BENEFITS

- Provides necessary lightning strike protection
- Senses damage in the underlying composite structure
- Sensor is robust
- Interrogation by radio frequency transponder
- Can be retrofitted to existing turbine blades
- Minimizes or eliminates wind turbine down-time and facilitates maintenance/repair if needed

technology solution

NASA Technology Transfer Program

Bringing NASA Technology Down to Earth

THE TECHNOLOGY

When a lightning leader propagates through the atmosphere in the vicinity of an aircraft, the lightning electromagnetic emissions generated from the moving electrical charge will impinge upon the aircraft before the actual charge attaches. As the lightning leader propagates closer to the aircraft, the radiated emissions at the aircraft will grow stronger. The SansEC sensor is designed to operate within the lightning radiated emission spectrum and thus is passively powered by the external oscillating magnetic field from the lightning itself. The sensor will resonate and generate its own oscillating magnetic and electric fields which have been demonstrated to influence lightning attachment and propagation.



The NASA technology can be used to protect tall structures from lightning strike damage.
Photo Credit: NASA

APPLICATIONS

The technology has several potential applications:

- Wind turbines
- Tall structures

PUBLICATIONS

Patent Pending

National Aeronautics and Space Administration

The Technology Gateway

Langley Research Center

Mail Stop 151
Hampton, VA 23681
757.864.1178
Information NASA Technology Transfer Pro

<http://technology.nasa.gov/>

www.nasa.gov

NP-2015-06-1906-HQ

NASA's Technology Transfer Program pursues the widest possible applications of agency technology to benefit US citizens. Through partnerships and licensing agreements with industry, the program ensures that NASA's investments in pioneering research find secondary uses that benefit the economy, create jobs, and improve quality of life.

LAR-18401-1

