

AOptix Technologies and NuCrypt demonstrate physical-layer quantum encryption

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AOptix Technologies, a leading edge developer of ultra-high bandwidth laser communication solutions, and NuCrypt, a provider of technology for ultra-high security over optical communication networks, disclosed today the recent completion of a first-of-its-kind quantum encryption test over free space optical (FSO) links for the United States Air Force Research Laboratory (AFRL) located in Rome, New York, with funding provided by the Air Force Office of Scientific Research in Arlington, Va.

Flying at 10,000ft with distances of up to 20km, AOptix provided long-distance 2.5 gigabit per second lasercom links for the series of encryption tests. AOptix applied their patented bi-directional Adaptive Optics correction to the wavefront distortions, caused by atmospheric turbulence. This high speed closed-loop control system insured link stability so that all of the encrypted light was inserted with minimal loss back into the fiber; a key fundamental element in the success of the tests.

In previous FSO link tests without AOptix terminals, NuCrypt experienced dramatic power fades due to turbulence and pointing errors, representing a significant, if not impossible, challenge. Teaming with AOptix provided a robust link solution that preserved the integrity of the encoded signal for this type of encryption over a wireless optical connection.

"This new capability adds to the impressive low probability of detection, low probability of interception (LPD/LPI) that only a lasercom link can provide. NuCrypt has transformed physical-layer security for free space optical lasercom" says Dean Senner, President and CEO of AOptix Technologies. "Lessons learned will be applied to much longer link distances in the future".

NuCrypt's proprietary "AlphaEta" quantum-noise randomized, physical-layer encryption technology represents a new paradigm in ultra-secure, high data-rate optical communications. Not only does AlphaEta bring elements of physics and traditional cryptography together to enhance security, it does so in a way that is robust and compatible with current optical communications infrastructure whether long distance fiber or FSO links.

"It is a testament to the robust nature of the AlphaEta encryption method and the capabilities of the AOptix free-space optical terminals that they can be combined to create ultra-secure Gigabit-per-second air-to-ground optical links," says Professor Prem Kumar, Founder and CEO of NuCrypt.

The AOptix wireless bi-directional optical terminals utilize a unique patented, single aperture, [adaptive optics](#) method of beam control to compensate for real-time [atmospheric turbulence](#) while maintaining lock between two terminals. Video, voice and data is transmitted through the air over a single invisible, low power, eye-safe, FSO laser link.

Source: Air Force Office of Scientific Research

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