Information Processing and Communications Laboratory (LTCI), Telecom Paris

ComLac

#DataEncryption #Communication #QuantumCascadeTechnologies

TELECOM Paris

INSTITUT POLYTECHNIQUE DE PARIS

THE PROBLEM ADDRESSED

Recent improvement in computational power created the need for more data-security. ComLaC proposes a complete system achieving both data encryption and transmission in free-space using mid-infrared lasers.

The solution is more secure than existing technology based on noise while remaining easier and cheaper to deploy than those using quantum cryptography.

Created in 1982, the LTCI is characterized by its broad scope in the field of information and communication sciences and technologies. The laboratory cover the full theme of digital communications from the hardware to the software including advanced photonic technologies.

TECHNOLOGY

- Module for free space communication, secured by photonic chaos operating in the thermal atmospheric medium.
- Uses quantum cascade technologies (ex. lasers & detectors) physically paired before deployment.
- Targeted at real-time continuous information exchanges (possible code cracking would at best take several hours)
- Technology fully extendable to fiber optic systems

COMPETITIVE ADVANTAGES

	RF	ComLaC	Quantum Cryptography
Low cost	+++	+	-
Simple to deploy	++	+	--
Lossless transmission	-	++	--
Effective range	+++	++	++
Cracking resistance	---	++	+++
Resilience to eave-dropping	---	+++	+ (Also rely on a classical channel)
Resilience to environment	+++	+++	---

APPLICATION

- Ground-to-air or air-to-ground transmission between fixed or mobile entities (ambassy, satellites, etc.)
- Ground-to-ground transmission in the absence of secured communication infrastructures

DEVELOPMENT STATUS

- Indoor secure transmission with bitrate close to 10 Mbit/s over 30 meters. The bit rate is tunable up to several hundred of Mbit/s.

INTELLECTUAL PROPERTY

- O. Spitz et F. Grillot, Priority Patent EP19306650 Submitted the 13/12/2019

INVENTORS & CONTACTS

- Frederic Grillot, Professor at Télécom- Paris, grillot@telecom-paris.fr
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PUBLICATIONS

- O. Spitz et al., Nature Communications, Vol. 12, p. 3327 (2021)

LOOKING FOR

- Partners for outdoor tests under real operating conditions.
- Engineering expertise in adaptative optics
- Expertise in propagation channels' modeling.
- Looking for partners with abilities to industrialize the solution