

Access control system by means non-conventional photonic crystal.

University of Chile has generated a system to access control that uses light patterns in conjunction with a flat-band photonic crystal as optical keys.

THE CHALLENGE

In the last years, the global market for electronic access control system has grown markedly mainly due to the increase in break-ins, robberies, frauds, etc.. This together with the need to overcome vulnerabilities in current methods of access control (such as smart cards, printed barcodes, RFIDs, magnetic strips, biometrics) have boosted the market of new technologies for controlled access.

This novel technology is extremely hard to hack approach, because it uses the unique properties of a non-conventional photonic crystal within an optical circuit, where said photonic crystal functions like an optical "padlock" that can only be unlocked with specific patterns of light.

THE TECHNOLOGY

This technology is an authentication system for granting access to either physical or digital infrastructures, which consists in the use of a non-conventional photonic crystal within an optical circuit with at least one flat band photonic crystal, which functions like an optical key.

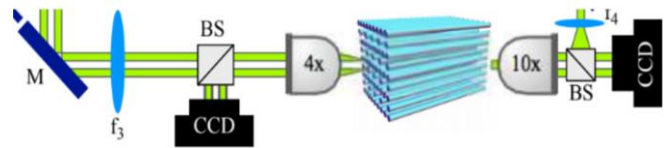
Using the non-conventional photonic crystal properties, it is possible to transmit patterns of light beams pre-conditioned with appropriate amplitude and phase. Furthermore, these light patterns could be codified to represent symbols, enabling the transmission of access codes and other confidential information.

STAGE OF DEVELOPMENT

- An early prototype of the module has been demonstrated, where patterns codified for numbers 0-9 were reliably transmitted for 10 cm.
- The first photonic crystals are currently being built.

COMPETITIVE ADVANTAGES

- The technology can be used alone or in combination with other means of securing and authenticating access in a multi-factor authentication scheme.
- Because each crystal has in geometry extremely difficult to reproduce, the resulting authentication is expected to be hard to hack.
- The light patterns have specific conditions of amplitude and phase, making them also very hard to read and reproduce.



Simplified schematic.

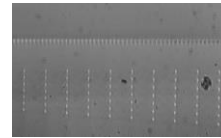


Photo of manufactured photonic crystal (1 cm x 2 cm x 1cm).

APPLICATIONS

- Physical controlled-access systems such as optical turnstiles, access gates, security vaults, automatic teller machines, etc..
- Access control to critical infrastructures such as bank vaults, controlled materials, laboratories, military facilities, etc.
- Anti-counterfeit/anti-piracy devices.

OPORTUNITY

Available for **out-licensing** and collaboration in scaling and industrial assembly.

INTELLECTUAL PROPERTY/REFERENCES

- Patent Applications CL 201501871 A1 and US 2018/0210150 A1.