

## Rezumatul fazei

In Etapa III s-au optimizat Modelul demonstrativ de laborator al sistemului C-ECSL si Modelul de simulare numerica dedicat pentru experimentarea, respectiv simularea, cripto-sistemelor selectate si s-a realizat o corelare a datelor obtinute. Optimizarea dispozitivului experimental a vizat si realizarea unei versiuni imbunatatite a aplicatiei soft de control de la distanta a sistemului C-ECSL. Cripto-sistemele selectate si implementate sunt (i) codificarea prin modularea curentului de injectie, respectiv modularea haosului (Chaotic shift keying - CSK), unde semnalul util-transmis moduleaza direct curentul de injectie al masterului; (ii) codificarea prin modularea RF electro-optica in faza a purtatoarei haotice master (master: ECSL-2), respectiv mascarea cu haos (chaotic masking – CMS), unde semnalul util moduleaza in frecventa, suplimentar semnalul RF; (iii) generarea secventelor de numere aleatoare (random bits sequence - RBS) bazat pe un discriminator de semnale de varf din seriile emisiilor laser haotice. Prin experimentarea cripto-sistemelor s-au determinat domeniile de valori ale parametrilor de functionare a dispozitivului experimental haotic, precum si modul optim de operare si limitarile acestuia in conditiile unui control de la distanta. Datele numerice au indicat o buna corelare cu datele experimentale. In final, s-a realizat validarea dispozitivului experimental haotic prin teste de control de la distanta si experimentarea de cripto-sisteme.

## Stage summary

In the Stage III, the laboratory demonstrative model of the C-ECSL system and the dedicated numerical simulation model were optimized for the experimentation, respectively the simulation, of the selected crypto-systems, and a correlation of the obtained data was made. The optimization of the experimental device also aimed at creating an improved version of the remote-control software application of the C-ECSL system. The crypto-systems selected and implemented are (i) encoding by modulating the injection current, respectively the chaos modulation method (chaotic shift keying - CSK), where the transmitted signal directly modulates the injection current of the master; (ii) encoding by RF electro-optical phase modulation of the master chaotic carrier (chaotic masking - CMS), where the transmitted signal frequency modulates the RF carrier signal; (iii) generation of random bits sequences (RBS) based on a discriminator of peak signals from the chaotic laser emissions series. By experimenting the crypto-systems, the ranges of values of the operating parameters of the chaotic C-ECSL system were determined, as well as the optimal mode operation and its limitations under the remote-control conditions. The numerical data indicated a good correlation with the experimental ones. Finally, the validation of the chaotic experimental device was achieved through remote control tests and the experimenting of cryptosystems.