Summary Stage I

In Stage I, the reported literature on the laser systems with chaotic emission, methods used in the transmission of coded information and random number generators based on chaotic dynamics were analyzed; the experimental system (chaotic experimental device) was designed and the technical characteristics of its main subassemblies were established on the basis of which it was made. The configuration of the device includes two laser diode systems with external cavities (ECSL systems, one of linear type and the other of ring-type) - the first with the possibility of amplitude modulation of the diode injection current, the other with phase electro-optical modulation; an oscilloscope and a spectrometer for temporal and spectral monitoring of the emissions of the two ECSL systems; a series of optical and optomechanical components for optical coupling of the two ECSL systems. For the realization of the device and in addition to the existing equipment's, adequate ones were purchased for the purpose and objectives of the project. Also, data were presented regarding the concept of the model, the design of the experimental model and the principles of the used methods, as well as the technical specifications of the main subassemblies.

Partner 1 of the project presented an analysis of the theoretical model selected to simulate the dynamics of the emission of lasers with external cavity (chaotic emission), data on its development for multimode laser emission, and an analysis of the principle that will underlie the evaluation of the quality of information encryption/decryption.