Department of Instrumentation Engineering

Training in modeling in Laser Physics and Photonics

Duration: 14 days

Supervisor: Professor Leonid A. Melnikov

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Language of training English

Audience: graduate students, undergraduates and young scientists with a PhD degree.

During the training the main principles of modeling and research of laser dynamics and photonics systems that are currently of the greatest interest for Laser Physics, Photonics and Telecommunicatiojns will be studied.
Research methods: Laser physics, density matrix equations, numerical schemes, Software: Fortran and C codes, Mathematica 8,11.

Objects of consideration:
1) VECSEL lasers, Raman fiber lasers, Laser gyros;
2) quantum fluctuations in optical solitons; quantum fluctuation in microresonators;
3) ultrashort pulses in lasers and fibers;
4) entangles states of the optical pulses

Issue for consideration:
1) Transport equations approach for the modeling of the dynamics of the lasers and cavities with opposite running waves.
2) Photonics systems with opposite running waves.
3) Methods of calculation of quantum fluctuations during propagation of soliton pulses in optical fibers. Nonlinear Fourier transform for telecommunication.
4) Quantum noise in SBS and Raman fiber amplifier.