Scientific supervisor	
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Proposed research topic

Quantum-state tomography

Short description (< 1000 characters)

The ability to generate and manipulate a quantum information lies at the very foundation of future quantum computers. Realization of the tasks necessitates identification of the systems capable of supporting long-time storage of quantum information. A particular example of such a system are alkali-metal atomic vapor. Illuminating the vapor with appropriate tuned and polarized light allows for the generation of specific quantum states in them. Moreover, optical techniques also enable reading out of the quantum information from the atoms.

During the internship the students will get acquainted with the methods of optical spectroscopy. By building a simple experimental system, they will learn about the principles of semiconductor lasers, means of their control and application for gas spectroscopy. The culmination of these works will be measurements of alkali-metal vapor and reconstruction of its quantum state, using the system existing at the Department of Photonics.

Main research tool

Laser spectroscopy. Used equipment: lasers, generators, oscilloscopes, computer.

Additional requirements to the candidate

- basic knowledge of physics

- experimental flair (mnemonic skills are welcome)

Possibility to continue student internship in the form of:

Diploma thesis (master's or bachelor's degree)	X
PhD study	X