SERIES OF CCQCN SEMINARS

Monday, 05th October 2015
&
Wednesday, 07th October 2015

11:00-13:00

3rd Floor Seminar Room

Fundamentals of Quantum Information, Control over Complex Quantum Systems and Coherence Protection

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Abstract

We present a short introduction to fundamentals of quantum information. We will describe the basic unit, i.e. the two-level qubit, its density matrix representation for pure and mixed states as well as the Bloch vector. We will discuss entanglement and its measures. Then we will introduce the three-qubit systems and specific gates and link them to quantum computing, control of the quantum state and control of the quantum evolution. We will then address the following topics: Quantum computer and quantum algorithms. Classical and quantum operations and classical calculations on quantum computer. Complex systems and quantum computer - the condition of universality. The control over entanglement - the main resource of quantum computations and the structure of quantum algorithms. We will close with the discussion of coherence protection for classical signals the protection against quantum errors and the issue of decoherence and types of coherence protection.