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EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání
pro konkurenceschopnost

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

Název projektu: Mezinárodní centrum pro informaci a neurčitost

Registrační číslo: CZ.1.07/2.3.00/20.0060

Zpráva z účasti na stáži

Datum konání stáže: 02.03.2014 – 29.03.2014

Navštívené pracoviště: Technical University of Denmark, Kgs. Lyngby, Denmark

Zahraniční garant: Prof. Ulrik L. Andersen

Účastník stáže: Ivan Derkach, Mgr.

Stručný popis navštíveného pracoviště

Technical University of Denmark (DTU) was founded in 1829 and today it is considered to be the best engineering university in the Nordic countries and one of the leading engineering institutions in Europe. DTU is recognized and respected globally for the quality of its research, graduates and university culture. DTU actively collaborates with other universities and institutions around the world and provides conditions for excellent research environment.

The visit was done to Quantum Physics and Information Technology (QPIT) section of the Department of Physics. The main focus of QPIT research group is on engineering of optical and solid state quantum systems, quantum information processing and quantum sensing.

Of particular interest is implementation of quantum key distribution protocols using squeezed states of light that possess a set of advantages comparing to protocols based on coherent states of light. The group is actively working on implementation of new protocols as well as on increasing their performance.

Průběh stáže

The main aim of the visit was joint scientific research in the field secure communication by means of continuous-variable quantum key distribution (CV QKD). Previously conducted theoretical research directed to application of QKD in realistic conditions concerned the effect of side channel presence on security and quantum-channel noise tolerance of QKD protocols. Side channel is a collective representation of all possible additional sources of information in classical and quantum domains available to attacker. During the visit the method for decreasing the negative influence of side-channel was optimized over various parameters of the protocol, such as limited reconciliation efficiency and channel transmission. In the course of stay obtained theoretical predictions and ways of decoupling method implementation were discussed. Additionally the theoretical as well as experimental basis needed for further experimental analysis of the matter were agreed upon with

QPIT group. Initial details of experiment along with possible issues of realization were also discussed.

Navázání kontaktů

The visit led to establishing of personal contacts and continuation and improvement of effective and successful cooperation between the Department of Optics of the Palacky University (Olomouc, Czech Republic) and QPIT science group of Technical University of Denmark (Kgs. Lyngby, Denmark).

Shrnutí stáže

The main purpose of the visit was accomplished and all set tasks were undoubtedly achieved. The visit was certainly advantageous for both collaboration sides as it led to establishing valuable new personal contacts. Furthermore the stay strengthened partnership between scientific institutions and set up basis for future conjoint research in the field of Continuous-Variable quantum key distribution.

Fotografická dokumentace

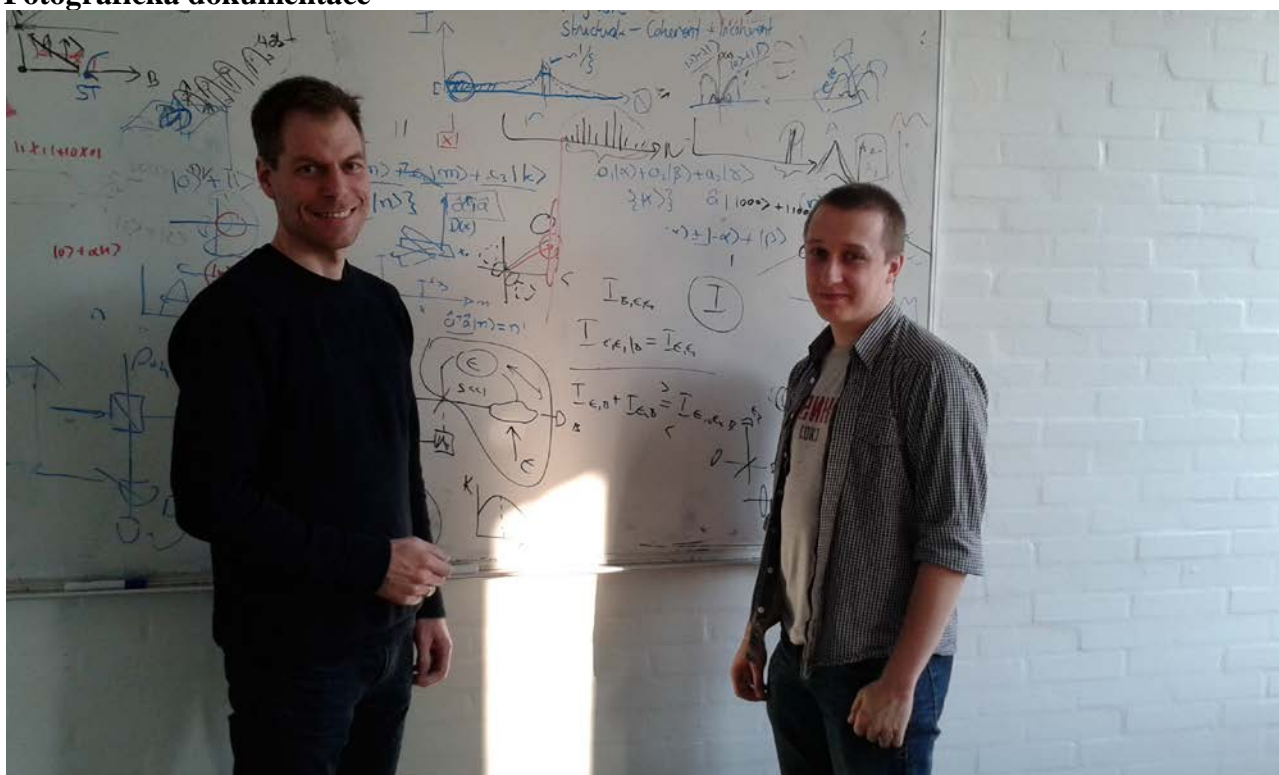


Photo taken during planning of experimental collaboration, depicted are Prof. Ulrik L. Andersen (left) and I. Derkach (right).

Ivan Derkach, Mgr.