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:	20.03.2012 – 17.04.2012
Navštívené pracoviště:	Danish Technical University, Lyngby, Dánsko
Zahraniční garant:	prof. Ulrik Andersen
Účastník stáže:	Vladyslav Usenko, Ph.D.

Stručný popis navštíveného pracoviště

Danish Technical University (DTU) was founded in 1829 as Denmark's first polytechnic, and is today ranked among Europe's leading engineering institutions, and the best engineering university in Scandinavia (according to the Times Higher Education ranking). DTU is the third top technical university in Europe in terms of citation impact, and the first in terms of the number of publications. DTU is very active in international collaboration and education, a half of the PhD students studying at DTU is from abroad as well the one third of the scientific staff. The University has exchange programs with 200 universities all over the world. The section of Quantum Physics and Information Technology (QPIT) designs quantum physics materials and processes to be used in sensors and information technology. The section consists of one professor, 2 associate professors, 5 post-docs and 6 Ph.D.-students. The section participates in numerous international projects, including EU-financed, as well as Danish projects. The group leader, Prof. Ulrik Andersen, is very active in the field of quantum optics and quantum information with the outstanding results, being regularly published in Nature Physics, Nature Photonics and Physical Review Letters.

Průběh stáže

The visit was dedicated to the joint scientific research in the field of Gaussian continuous-variable quantum key distribution. In particular, the project aimed at the weak Gaussian modulation of squeezed states we carried out during the visit. The corresponding protocol was theoretically proposed in Olomouc, while the proof-of-principle experiment was carried out in Lyngby by Lars Madsen (Ph.D. student at the DTU QPIT section) under the supervision of Prog. Andersen. The idea of the experiment was to show the possibility to decouple a potential eavesdropper from a quantum channel using squeezed state as a resource and applying optimal (strongly reduced) modulation. The experimental set-up was discussed during the visit and the region of parameters of interest was established. Lately the experimentally obtained data was analyzed and the experimental conditions were adjusted in

the continuous information exchange between the theoretical and experimental partners of the project. Finally, the desired effect was observed upon the optimal experimental conditions.

Publikace rozpracované během stáže
The experimental and theoretical results are being currently arranged in the publication, scheduled to submission in 2012.

Navázání kontaktů
The visit led to further intensification of the collaboration between the Department of Optics of the Palacky University in Olomouc and the experimental QPIT group in Lyngby. The fruitful contacts were established also with the younger researcher, actively dealing with the experiments.

Shrnutí stáže
The visit indeed achieved its goals, the scientific collaboration with one of the leading European institutions in the field of quantum optics and quantum information was successfully established and intensified. The new knowledge on the current research trends in the mentioned field was obtained and will be further disseminated to the target group within the scientific seminars.

Fotografická dokumentace

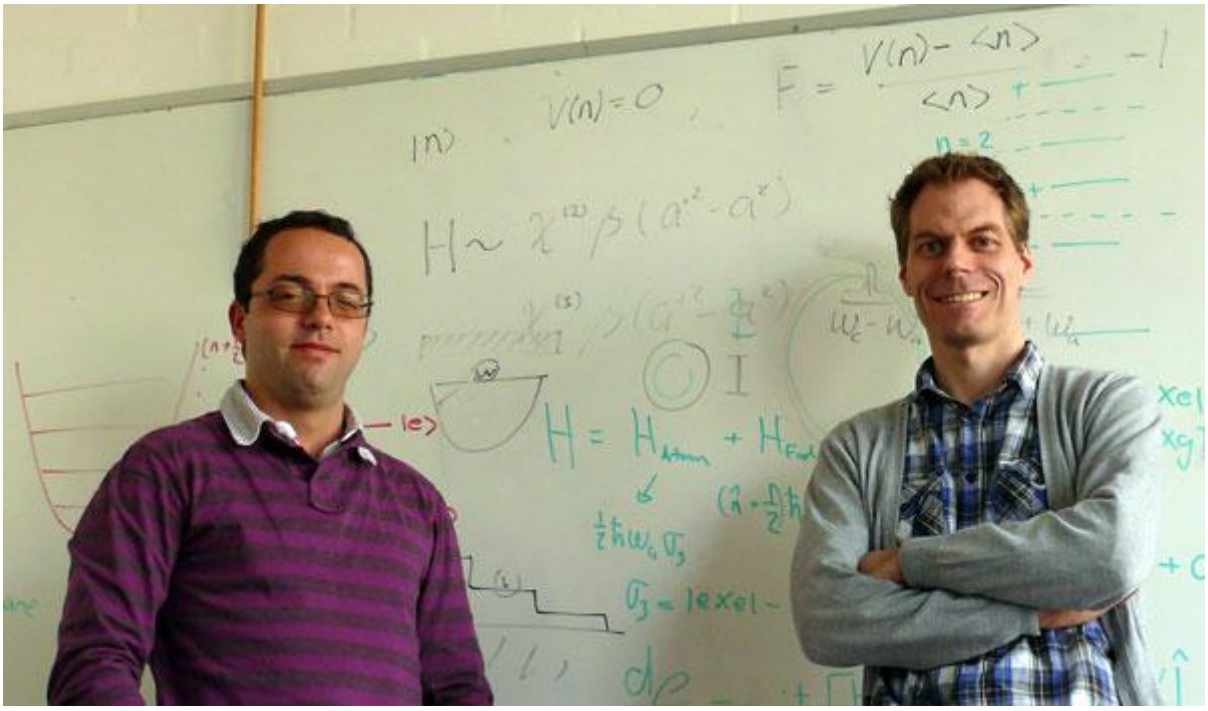

Photo taken during the scientific discussion within the stay, depicted are and Dr. Usenko (left) and Prof. Andersen (right).