PROJECT FINAL REPORT

Use and dissemination of foreground

Grant Agreement number: 212008

Project acronym: COMPAS

Project title: Computing with Mesoscopic Photonic and Atomic States

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Name of the scientific representative of the project's co-ordinator, Title and Organisation:

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Use and dissemination of foreground

Section A (public)

The primary dissemination measure within project COMPAS was the publication of scientific papers in top international peer-reviewed scientific journals. COMPAS resulted in 120 published papers that are listed in the table below. The list includes several publications in the most prestigious journals, such as Nature Physics, Nature Photonics and PNAS. All these publications attracted media attention, which helped increase the awareness of a broad public about the project and its outcomes. Several other papers are currently submitted for publication or under preparation. For instance, an in-depth review paper entitled *Gaussian Quantum Information* has recently been submitted to Reviews of Modern Physics. Whenever possible, preprints of the papers have been made freely available on the online depositories such as arXiv.org. Several papers were also published in high-quality open-access journals, such as Optics Express or New Journal of Physics.

The members of COMPAS scientific teams have been regular participants in several major international scientific conferences on quantum information processing, and the COMPAS senior members very often acted as invited speakers. These conference presentations provided an excellent platform for rapid dissemination of the newest results. In this context, the COMPAS consortium also maintained the tradition of a series of international workshops specifically focused on continuous-variable quantum information processing (CV-QIP workshops). This series was initiated already in the year 2002, when the first such meeting (CV-QIP'02) was held in Brussels. The great success of this workshop triggered the interest in continuous-variable quantum information processing and was an incentive for starting this workshop series. These workshops turned out to be extremely successful and popular, and they have attracted the attention of a broader audience of the top world researchers in the field of continuous-variable quantum information processing. Each workshop was attended by about 40-50 scientists from Europe as well as from the overseas (USA, Australia, Japan). The two latest workshops in this series were organized in June 2010 in Herrsching (CV-QIP'10) and in September 20011 in Paris (CV-QIP'11), which shows that this series keeps its importance even after the end of the project COMPAS. The CV-QIP workshops will continue to provide a unique platform for brainstorming on the perspectives of the CV paradigm and for identifying the potential medium-term scientific spin-offs of the field.

The COMPAS members will also actively continue to present their results to a wide audience. During the project, the promotion of quantum information research to the general public was made by publishing articles in popularizing science magazines and newspapers, and by making efforts to attract the attention of popular media. A recent example of such a dissemination activity is an interview of professor Eugene Polzik, member of COMPAS, by Cyrus Farivar, the host of Spectrum (http://dw-world.de/spectrum), a weekly radio program on science and technology issues on Deutsche Welle English. The subject of this interview was long-lived entanglement of atomic objects. Other examples include public lectures

P. Grangier, Conférence *Du laser à la cryptographie quantique*, Institut d'Optique, Palaiseau, 50e Anniversaire du laser (2010).

P. Grangier, Conférence *La physique quantique illustrée par la lumière*. Lycée Costebelle, Hyères (Var), Conférence ULTS pour les Lycées (2010)

and a recent popular science article in the French version of Scientific American:

J. Laurat, *Mémoires quantiques : stocker l'insaisissable*, Pour la Science, pp. 102-110, Dossier "*Le monde quantique: Terre promise pour le traitement de l'information?*" (2010).

The results of COMPAS were also described in several recent articles on some major web servers dedicated to providing information about research:

Mullins, J., *How to make quantum entanglement last*, newscientist.com, 2011
http://www.newscientist.com/article/dn20711-how-to-make-quantum-entanglement-last.html

Zyga, L., *Entanglement between macroscopic objects generated by dissipation*, PhysOrg.com, 2011
http://www.physorg.com/news/2011-08-entanglement-macroscopic-dissipation.html

Urth, J., *Quantum computers moving closer*, Videnska, 2010
http://videnskab.dk/teknologi/kvantecomputere-rykker-taettere-pa

As a part of its activities, the COMPAS consortium prepared a *Roadmap on CV-QIPC* aiming at supplementing the *QIPC strategic report* by further elaborating on the topic of continuous-variable quantum information processing, which was only briefly touched upon in there. This Roadmap treats the progress of the CV-QIPC field worldwide, and outlines the main directions of future research as well as the overall vision of this subfield. The current version of the Roadmap can be found on public website of project COMPAS, http://optics.upol.cz/compas. The COMPAS consortium intends to submit this Roadmap to a suitable scientific journal for publication in order to increase the public awareness about this field and its impact.

Given its fundamental nature, the project COMPAS did not directly produce exploitable results, defined as knowledge having a potential for industrial or commercial application in research activities or for developing, creating or marketing a product or process or for creating or providing a service. The results obtained by the COMPAS consortium are made freely accessible to all experts as well as to the public. It is expected that these results will form a basis for future applied research leading to patentable quantum communication technologies. If the situation arises that results having potential for further commercial exploitation will be achieved in the future based on the current project results, then appropriate measures such as patent applications will be taken to protect this intellectual property.

TEMPLATE A: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES										
NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers[1] (if available)	Is/Will open access[2] provided to this publication?
1	Preparation of non-local superposition's of quasi-classical light states	Alexei Ourjoumtsev	Nature Physics	Vol. 5	Nature Publishing Group	UK	2009	pp. 189 - 182	doi: 10.1038/nphys1199	Yes
2	Experimental entanglement distillation of mesoscopic quantum states	R. Dong	Nature Physics	Vol. 4	Nature Publishing Group	UK	2008	919 - 923	http://arxiv.org/abs/0812.0709	yes
3	Noise-powered probabilistic concentration of phase information	M. A. Usuga	Nature Physics	Vol. 6	Nature Publishing Group	UK	2010	767 -771	http://arxiv.org/ abs/1005.3706	yes
4	A high-fidelity noiseless amplifier for quantum light states	A. Zavatta	Nature Photonics	Vol. 5	Nature Publishing Group	UK	2011	52-56	http://arxiv.org/abs/1004.3399	Yes
5	Quantum optical coherence can survive photon losses using a continuous-variable quantum erasure-correcting code	M. Lassen	Nature Photonics	Vol. 4	Nature Publishing Group	UK	2010	767-771	http://arxiv.org/ abs/1005.3706	yes
6	Preparation of distilled and purified continuous-variable entangled states	B. Hage	Nature Physics	Vol. 4	Nature Publishing Group	UK	2008	915-918	http://arxiv.org/abs/0812.0738	Yes

[1] A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).
[2] Open Access is defined as free of charge access for anyone via the internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

7	Tomography of quantum detectors	J. Lundeen	Nature Physics	Vol. 5	Nature Publishing Group	UK	2009	27	http://arxiv.org/abs/0807.2444	yes
8	Quantum memory for entangled continuous-variable states	K. Jensen	Nature Physics	Vol. 7	Nature Publishing Group	UK	2011	13-16	http://arxiv.org/abs/arXiv:1002.1920	Yes
9	Mesoscopic atomic entanglement for precision measurements beyond the standard quantum limit	J. Appel	Proceedings Of The National Academy Of Sciences	Vol. 106	National Academy of Sciences	USA	2009	10960-10965	http://arxiv.org/abs/0810.3545	yes
10	Experimentally Feasible Quantum Erasure-Correcting Code for Continuous Variables	J. Niset	Physical Review Letters	Vol. 101, Issue 13	American Physical Society	USA	2008	pp. 130503-1 130503-4	http://arxiv.org/abs/0710.4858	yes
11	Electronic noise-free measurements of squeezed light	L. A. Krivitsky	Optics Letters	Vol. 33, Issue 20	Optical Society of America	USA	2008	pp. 2395-2397	http://arxiv.org/abs/0807.1446	yes
12	Experimental continuous-variable cloning of partial quantum information	M. Sabuncu	Physical Review A	Vol. 78, Issue 05	American Physical Society	USA	2008	052312-1 052312-5	http://arxiv.org/abs/0805.0262	yes
13	Quantum filtering of optical coherent states	C. Wittmann	Physical Review A	Vol. 78, Issue 3	American Physical Society	USA	2008	pp. 032315-1 032315-6	http://arxiv.org/abs/0704.1918	yes
14	Demonstration of a Quantum Nondemolition Sum Gate	J. Yoshikawa	Physical Review Letters	Vol. 101, Issue 25	American Physical Society	USA	2008	250501-1 250501-4	http://arxiv.org/abs/0808.0551	yes
15	Correlation measurement of squeezed light	L. A. Krivitsky	Physical Review A	Vol.79,No 03	American Physical Society	USA	2009	033828-1 033828-6	http://arxiv.org/abs/0903.3999	yes
16	Quadrature measurements of a bright squeezed state via sideband swapping	J. Schneider	Optics Letters	Vol. 34, Issue 8	Optical Society of America	USA	2009	1186-1188	www.opticsinfobase .org/abstract.cfm?uri= ol-34-8-1186	no
17	Continuous Variable	M. Lassen	Physical	Vol. 102, Issue	American	USA	2009	163602-1	http://arxiv.org/abs/0901.2783	yes

	Entanglement and Squeezing of Orbital Angular Momentum States		Review Letters	16	Physical Society			163602-4		
18	Observation of Spatial Quantum Correlations Induced by Multiple Scattering of Nonclassical Light	S. Smolka	Physical Review Letters	Vol. 102, Issue 19	American Physical Society	USA	2009	193901-1 193901-4	http://arxiv.org/abs/1103.0968	yes
19	Demonstration of Quadrature-Squeezed Surface Plasmons in a Gold Waveguide	A. Huck	Physical Review Letters	Vol. 102, Issue 24	American Physical Society	USA	2009	246802-1 246802-4	http://arxiv.org/abs/0901.3969	yes
20	The Einstein-Podolsky-Rosen paradox: from concepts to applications	M. D. Reid	Reviews of Modern Physics	Vol. 81	American Physical Society	USA	2009	1727-1751	http://arxiv.org/abs/0806.0270	yes
21	Continuous-variable quantum information processing	U.L. Andersen	Laser & Photonics Reviews	vol: 4, issue: 3,	Wiley-VCH	DE	2010	337-354	http://arxiv.org/abs/1008.3468	yes
22	A novel method for polarization squeezing with Photonic Crystal Fibers	J. Milanovic	Optics Express	vol: 18, issue: 2,	Optical Society of America	USA	2010	1521-1527	http://arxiv.org/abs/0902.4597	yes
23	Assessing the Polarization of a Quantum Field from Stokes Fluctuations	A. B. Klimov	Physical Review Letters	Vol. 105, Issue 15	Optical Society of America	USA	2010	153602-1 153602-4	http://arxiv.org/abs/1004.3283	yes
24	Continuous-variable entanglement distillation of non-Gaussian mixed states	R. Dong	Physical Review A	Vol. 82, Issue 01	Optical Society of America	USA	2010	012312-1 012312-14	http://arxiv.org/abs/1002.0280	yes
25	Demonstration of Coherent-State Discrimination Using a Displacement-Controlled Photon-Number-Resolving Detector	C. Wittmann	Physical Review Letters	Vol. 104, Issue 10	Optical Society of America	USA	2010	100505-1 100505-4	http://arxiv.org/abs/0906.2859	yes
26	Discrimination of binary coherent states using a homodyne detector and a photon number resolving detector	C. Wittmann	Physical Review A	Vol. 81, Issue 06	Optical Society of America	USA	2010	062338-1 062338-11	http://arxiv.org/abs/1002.0232	yes
27	Discrimination of optical	C. Wittmann	Journal of	Vol. 57, No. 3	Taylor &	UK	2010	213–217	http://arxiv.org/	yes

	coherent states using a photon number resolving detector		Modern Optics		Francis				abs/0905.2496	
28	Environment-assisted quantum-information correction for continuous variables	M. Sabuncu	Physical Review A	Vol.. 81, Issue 01	Optical Society of America	USA	2010	012325-1 012325-9	http://arxiv.org/ abs/0909.3546	yes
29	Experimental demonstration of squeezed-state quantum averaging	M. Lassen	Physical Review A	Vol.. 82, Issue 02	Optical Society of America	USA	2010	021801-1 021801-9	http://arxiv.org/ abs/1002.2324	yes
30	Hybrid Long-Distance Entanglement Distribution Protocol	J. B. Brask	Physical Review Letters	Vol. 105, Issue16	Optical Society of America	USA	2010	160501-1 160501-4	http://arxiv.org/ abs/1004.0083	yes
31	Low-Threshold Optical Parametric Oscillations in a Whispering Gallery Mode Resonator	J. U. Fürst	Physical Review Letters	Vol. 105, Issue 26	Optical Society of America	USA	2010	263904-1 263904-4	http://arxiv.org/ abs/1010.5282	yes
32	Naturally Phase-Matched Second-Harmonic Generation in a Whispering-Gallery-Mode Resonator	J. U. Fürst	Physical Review Letters	Vol. 104, Issue15	Optical Society of America	USA	2010	153901-1 153901-4	http://arxiv.org/ abs/0912.3864	yes
33	Controlled Coupling of a Single Nitrogen-Vacancy Center to a Silver Nanowire	A. Huck	Physical Review Letters	Vol. 106, Issue 09	Optical Society of America	USA	2011	096801-1 096801-4	http://arxiv.org/ abs/1012.4416	yes
34	Entangling Different Degrees of Freedom by Quadrature Squeezing Cylindrically Polarized Modes	C. Gabriel	Physical Review Letters	Vol. 106, Issue 06	Optical Society of America	USA	2011	060502-1 060502-4	http://prl.aps.org/ abstract/PRL/ v106/i6/e060502	no
35	Quantum Light from a Whispering-Gallery-Mode Disk Resonator	J. U. Fürst	Physical Review Letters	Vol. 106, Issue 11	Optical Society of America	USA	2011	113901-1 113901-4	http://arxiv.org/ abs/1008.0594	yes
36	Generation and direct detection of broadband mesoscopic polarization-squeezed vacuum	T. Iskhakov	Physical Review Letters	Vol. 102, Issue18	American Physical Society	USA	2009	183602-1 183602-4	http://arxiv.org/ abs/0901.0371v1	yes
37	Experimental verification of	M. Avenhaus	Physical	Vol. 79, Issue	American	USA	2009	043836-1	http://arxiv.org/	yes

	high spectral entanglement for pulsed waveguided spontaneous parametric down-conversion		Review A	04	Physical Society			043836-5	abs/0810.0998v1	
38	Two-Color Bright Squeezed Vacuum	I. N. Agafonov	Physical Review A	Vol. 82, Issue01	American Physical Society	USA	2010	011801-1 011801-4	http://arxiv.org/ abs/0910.4831v4	yes
39	Macroscopic Pure State of Light Free of Polarization Noise	T. Sh. Iskhakov	Physical Review Letters	Vol. 106, Issue11	American Physical Society	USA	2011	113602-1 113602-4	http://arxiv.org/ abs/1011.1840v1	Yes
40	Implementation of a nondeterministic optical noiseless amplifier	Franck Ferreyrol	Physical Review Letters	Vol.104, Issue 12	American Physical Society	USA	2010	123603	doi: 10.1103/PhysRevLett.104.123603	yes
41	Multimode model for projective photon-counting measurements	Rosa Tualle-Brouri	Physical Review A	Vol. 80, Issue 01	American Physical Society	USA	2009	013806	doi: 10.1103/PhysRevA.80.013806	yes
42	Non-Gaussianity of quantum states: an experimental test on single-photon added coherent states	Marco Barbieri	Physical Review A	Vol. 82, Issue 06	American Physical Society	USA	2010	063833	doi: 10.1103/PhysRevA.82.063833	yes
43	Experimental realization of a nondeterministic optical noiseless amplifier	Franck Ferreyrol	Physical Review A	Vol. 83, Issue 06	American Physical Society	USA	2011	063801	doi: 10.1103/PhysRevA.83.063801	yes
44	Quantum repeaters with entangled coherent states	Nicolas Sangouard	JOSA B	Vol 27, No 6	The Optical Society	USA	2010	A137-A145	doi:10.1364/JOSAB.27.00A137	yes
45	Generation of pulsed and continuous-wave squeezed light with ^{87}Rb vapor	Imad H. Agha	Optics Express	Vol. 18	The Optical Society	USA	2010	pp. 4198 - 4205	doi:10.1364/OE.18.004198	yes
46	Time-resolved detection of relative-intensity squeezed nanosecond pulses in an ^{87}Rb vapor	Imad H. Agha	New Journal of Physics	Vol.13	Institute of Physics and Deutsche Physikalische Gesellschaft	UK	2011	043030	doi:10.1088/1367-2630/13/4/043030	Yes
47	Reversible quantum interface for tunable single sideband modulation	J. Cviklinski	Physical Review Letters	Vol. 101, Issue 13	American Physical Society	USA	2008	133601 (4 pages)	Doi:10.1103/ PhysRevLett.101.133601	No

48	Atomic-ensemble-based quantum memory for sideband modulations	J. Ortalo	Journal of Physics B : Atomic, molecular and optical physics	Vol 42	IOP PUBLISHING	Europe	2009	114010 (8 pages)	doi:10.1088/0953-4075/42/11/114010	No
49	Vacuum squeezed light for atomic memories at the D2 cesium line	J. Laurat	Optics Express	Vol. 17	Optical Society of America	USA	2009	3777-3781	doi:10.1364/OE.17.003777	yes
50	Heralding the storage of light	J. Laurat	Physics	Vol. 2, Issue 62	American Physical Society	USA	2009	62	DOI: 10.1103/Physics.2.62	yes
51	Quantum repeaters with entangled coherent states	J. Laurat	Journal of the optical society of America B	Vol. 27, Issue 6	Optical Society of America	USA	2010	A137-A145	doi:10.1364 JOSAB.27.00A137	no
52	Quantum memory for light via stimulated off-resonant Raman process: beyond the three-level L-scheme approximation	A.S. Sheremet	Physical Review A	Vol. 82, Issue 3,	American physical society	USA	2010	033838 (7 pages)	DOI: 10.1103/ PhysRevA.82.033838	no
53	Electromagnetically induced transparency on a Doppler broadened L-transition with multiple excited levels	O.S. Mishina	Physical Review A	Vol. 83, Issue 5	The American physical society	USA	2011	053809 (15 pages)	DOI:10.1103/ PhysRevA.83.053809	no
54	Gapped Two-Body Hamiltonian for Continuous-Variable Quantum Computation	Leandro Aolita	Physical Review Letters	Vol. 106, Issue 09	American Physical Society	USA	2011	090501	http://prl.aps.org/abstract/PRL/v106/i9/e090501	No
55	Sequential measurement-based quantum computing with memories	Augusto Roncaglia	Physical Review A	Vol. 83, Issue 06	American Physical Society	USA	2011	062332	http://pra.aps.org/abstract/PRA/v83/i6/e062332	No
56	Tests of multimode quantum non-locality with homodyne measurements	Alessandro Ferraro	Physical Review A	Vol. 79, Issue 01	American Physical Society	USA	2009	012112	http://pra.aps.org/abstract/PRA/v79/i1/e012112	No
57	Quantum Non-locality and Partial Transposition for	Alejo Salles	Physical Review	Vol. 101, Issue 04	American Physical	USA	2008	040404	http://prl.aps.org/abstract/PRL/v101/i4/e040404	No

	Continuous-Variable Systems		Letters		Society					
58	Bell inequalities from multilinear contractions	Alejo Salles	Quantum Information and Computation	Vol. 10	Rinton Press	USA	2010	0703-0719	http://www.rintonpress.com/journals/qiconline.html#v10n78	No
59	Quantum processing photonic states in optical lattices	C. A. Muschik	Physical Review Letters	Vol 100, Issue 06	American Physical Society	USA	2008	063601	http://arxiv.org/abs/quant-ph/0611093	Yes
60	Matter - wave emission in optical lattices: Single particle and collective effects	I. de Vega	Physical Review Letters	Vol. 101, Issue 26	American Physical Society	USA	2008	260404	http://arxiv.org/abs/0807.1901	Yes
61	How long can a quantum memory withstand depolarizing noise?	F. Pastawski	Physical Review Letters	Vol. 103, Issue 08	American Physical Society	USA	2009	080501	http://arxiv.org/abs/0904.4861	Yes
62	Assessing non-Markovian dynamics	M. M. Wolf	Physical Review Letters	Vol. 101, Issue 15	American Physical Society	USA	2008	150402	http://arxiv.org/abs/0711.3172	Yes
63	A de Finetti representation theorem for infinite dimensional quantum systems and applications to quantum cryptography	R. Renner	Physical Review Letters	Vol. 102, Issue 11	American Physical Society	USA	2009	110504	http://arxiv.org/abs/0809.2243	Yes
64	Towards Quantum Superposition of Living Organisms	O. Romero-Isart	New Journal of Physics	Vol. 12	Institute of Physics & Deutsche Physikalische Geselleschaft	Europe	2010	033015	http://iopscience.iop.org/1367-2630/12/3/033015	Yes
65	Detecting Quantum States with a Positive Wigner Function beyond Mixtures of Gaussian States	R. Filip	Physical Review Letters	Vol. 106, Issue 20	American Physical Society	USA	2011	200401	DOI: 10.1103/PhysRevLett.106.200401	No
66	Demonstration of a reversible phase-insensitive optical amplifier	R. Filip	Physical Review A	Vol 83, Issue 05	American Physical Society	USA	2011	052307	http://arxiv.org/abs/1101.1139	Yes
67	Measurement-induced	L. Mišta	Physical	Vol. 83, Issue	American	USA	2011	042325	http://arxiv.org/abs/1012.4302	Yes

	disturbances and nonclassical correlations of Gaussian states		Review A	04	Physical Society					
68	Distillation and purification of symmetric entangled Gaussian states	J. Fiurášek	Physical Review A	Vol. 82, Issue 04	American Physical Society	USA	2010	042331	http://arxiv.org/abs/1011.0824	Yes
69	Coherent-state phase concentration by quantum probabilistic amplification	P. Marek	Physical Review A	Vol. 81, Issue 02	American Physical Society	USA	2010	022302	http://arxiv.org/abs/0907.2402	Yes
70	Continuous-variable teleportation of a negative Wigner function	L. Mišta	Physical Review A	Vol. 82, Issue 01	American Physical Society	USA	2010	012322	http://arxiv.org/abs/1012.5616	Yes
71	Squeezing restoration by a noisy probe from a classically correlated environment	R. Filip	Physical Review A	Vol. 81, Issue 03	American Physical Society	USA	2010	032330	DOI: 10.1103/PhysRevA.81.032330	No
72	Elementary gates for quantum information with superposed coherent states	P. Marek	Physical Review A	Vol. 82, Issue 01	American Physical Society	USA	2010	014304	http://arxiv.org/abs/1006.3644	Yes
73	Noise-resilient quantum interface based on quantum nondemolition interactions	P. Marek	Physical Review A	Vol. 81, Issue 04	American Physical Society	USA	2010	042325	http://arxiv.org/abs/1002.0225	Yes
74	Gaussification of quantum states of traveling light beams in atomic memory	J. Fiurášek	Physical Review A	Vol. 82, Issue 02	American Physical Society	USA	2010	022334	http://arxiv.org/abs/1009.4808	Yes
75	Iterative Entanglement Distillation: Approaching the Elimination of Decoherence.	J. Fiurášek	Physical Review Letters	Vol. 105, Issue 23	American Physical Society	USA	2010	230502	http://arxiv.org/abs/1007.1508	Yes
76	Engineering quantum operations on traveling light beams by multiple photon	J. Fiurášek	Physical Review A	Vol. 80, Issue 05	American Physical Society	USA	2009	053822	http://arxiv.org/abs/0910.4104	Yes

	addition and subtraction									
77	Gaussian-optimized preparation of non-Gaussian pure states	D. Menzies	Physical Review A	Vol. 79, Issue 01	American Physical Society	USA	2009	012313	DOI: 10.1103/PhysRevA.79.012313	No
78	Resources for universal quantum-state manipulation and engineering	P. Marek	Physical Review A	Vol. 79, Issue 06	American Physical Society	USA	2009	062321	http://arxiv.org/abs/0908.1476	Yes
79	Quantum interface to a noisy system through a single kind of arbitrary Gaussian coupling with limited interaction strength	R. Filip	Physical Review A	Vol. 80, Issue 02	American Physical Society	USA	2009	022304	DOI: 10.1103/PhysRevA.80.022304	No
80	Improving continuous-variable entanglement distribution by separable states	L. Mišta	Physical Review A	Vol. 80, Issue 03	American Physical Society	USA	2009	032310	http://arxiv.org/abs/0804.3957	Yes
81	Mixed-state localizable entanglement for continuous variables	L. Mišta	Physical Review A	Vol. 78, Issue 01	American Physical Society	USA	2008	012359	http://arxiv.org/abs/0805.3088	Yes
82	Generating "squeezed" superpositions of coherent states using photon addition and subtraction	P. Marek	Physical Review A	Vol. 78, Issue 06	American Physical Society	USA	2008	063811	http://arxiv.org/abs/0812.1626	Yes
83	Excess-noise-free recording and uploading of nonclassical states to continuous-variable quantum memory	R. Filip	Physical Review A	Vol. 78, Issue 01	American Physical Society	USA	2008	012329	http://arxiv.org/abs/0804.3368	Yes
84	No-Go Theorem for Gaussian Quantum Error Correction	J. Niset	Physical Review Letters	Vol. 102, Issue 12	American Physical Society	USA	2009	120501	http://arxiv.org/abs/0811.3128	Yes
85	Security of continuous-variable quantum key distribution: towards a de	A. Leverrier	New Journal of Physics	Vol. 11	Institute of Physics & Deutsche	Europe	2009	115009	http://arxiv.org/abs/0907.3696	Yes

	Finetti theorem for rotation symmetry in phase space				Physikalische Geselleschaft					
86	Capacity of a bosonic memory channel with Gauss-Markov noise	J. Schäfer	Physical Review A	Vol. 80, Issue 06	American Physical Society	USA	2009	062313	http://arxiv.org/abs/0907.0982	Yes
87	Gaussianity bounds for quantum mixed states with a positive Wigner function	A. Mandilara	J. Phys.: Conf. Ser	Vol. 254	Institute of Physics	Europe	2010	012011		No
88	Quantum de Finetti theorem in phase-space representation	A. Leverrier	Physical Review A	Vol. 80, Issue 01	American Physical Society	USA	2009	010102	http://arxiv.org/abs/0904.4862	Yes
89	Extending Hudson's theorem to mixed quantum states	A. Mandilara	Physical Review A	Vol. 79, Issue 06	American Physical Society	USA	2009	062302	http://arxiv.org/abs/0808.2501	Yes
90	Strong No-Go Theorem for Gaussian Quantum Bit Commitment	L. Magnin	Physical Review A	Vol. 81, Issue 01	American Physical Society	USA	2010	010302	http://arxiv.org/abs/0905.3419	Yes
91	Multi-mode Gaussian bosonic channels	F. Caruso	New Journal of Physics	Vol. 10	Institute of Physics & Deutsche Physikalische Geselleschaft	Europe	2008	083030	http://arxiv.org/abs/0804.0511	Yes
92	Probing the local relaxation of cold atoms in optical superlattices	A. Flesch	Physical Review A	Vol. 78, Issue 03	American Physical Society	USA	2008	033608	http://arxiv.org/abs/0808.3779	Yes
93	A proposed testbed for detector tomography	J. Eisert	Journal of Modern Optics	Vol. 56	Taylor & Francis	UK	2009	432	http://arxiv.org/abs/0902.4384	Yes
94	Entanglement quantification from incomplete measurements: Applications using photon-number resolving weak homodyne detectors	G. Puentes	New Journal of Physics	Vol. 12	Institute of Physics & Deutsche Physikalische Geselleschaft	Europe	2010	033042	http://arxiv.org/abs/0911.2482	Yes

95	Limitations of quantum computing with Gaussian cluster States	M. Ohliger	Physical Review A	Vol. 82, Issue 04	American Physical Society	USA	2010	042336	http://arxiv.org/abs/1004.0081	Yes
96	Exploring local quantum many-body relaxation by atoms in optical superlattices	M. Cramer	Physical Review Letters	Vol. 101, Issue 06	American Physical Society	USA	2008	063001	http://arxiv.org/abs/0805.0798	Yes
97	Gaussian quantum marginal problem	J. Eisert	Commun. In Math. Phys.	Vol. 280	Springer	DE	2008	263		No
98	An approximate beamsplitter interaction between light and atomic ensembles	R. Tatham	Physica Scripta	T143			2011	014023	http://iopscience.iop.org/1402-4896/2011/T143/014023	No
99	Quantum interface between light and atomic ensembles	K. Hammerer	Rev. Mod. Phys.	Vol. 82	American Physical Society	USA	2010	1041	http://arxiv.org/abs/0807.3358	Yes
100	Entanglement-assisted atomic clock beyond the projection noise limit	Louchet-Chauvet	New Journal Of Physics	Vol. 12, No. 6	Institute of Physics	UK	2010	06503	http://arxiv.org/abs/arXiv:0912.3895	Yes
101	Quantum polarization spectroscopy of correlations in attractive fermionic gases	T. Roscilde	New Journal of Physics	Vol. 11, No. 5	Institute of Physics	UK	2009	055041	http://arxiv.org/abs/0901.3091	Yes
102	Quantum Noise Limited and Entanglement-Assisted Magnetometry	W. Wasilewski	Physical Review Letters	Vol. 104, Issue 13	American Physical Society	USA	2010	133601	http://arxiv.org/abs/0907.2453	Yes
103	Directly Estimating Nonclassicality	A. Mari	Phys. Rev. Lett.	Vol. 106, Issue 1	American Physical Society	USA	2011	010403	http://arxiv.org/abs/1005.1665	Yes
104	Hybrid Long-Distance Entanglement Distribution Protocol	J.B. Brask	Physical Review Letters	Vol. 105, Issue 16	American Physical Society	USA	2010	160501	http://arxiv.org/abs/1004.0083	Yes

105	Time gating of heralded single photons for atomic memories	B.M. Nielsen	Optics Letters	Vol. 34	OSA	USA	2009	3872	http://arxiv.org/abs/0909.0646	Yes
106	Generation of two-mode squeezed and entangled light in a single temporal and spatial mode	W. Wasilewski	Optics Express	Vol. 17	OSA	USA	2009	14444	http://arxiv.org/abs/0907.0132	Yes
107	High quality anti-relaxation coating material for alkali atom vapor cells	M. V. Balabas	Opt. Express	Vol. 18, No. 6	OSA	USA	2010	5825-5830	http://arxiv.org/abs/0911.5274	Yes
108	Squeezing of atomic quantum projection noise	P. Windpassinger	Journal Of Modern Optics	Vol. 56, No. 18--19	Taylor & Francis	UK	2009	1993-1998	http://arxiv.org/abs/0906.2572	Yes
109	Fast entanglement distribution with atomic ensembles and fluorescent detection	J.B. Brask	Phys. Rev. A	Vol. 81, Issue 2	American Physical Society	USA	2010	020303	http://arxiv.org/abs/0907.3839	Yes
110	Dissipatively driven entanglement of two macroscopic atomic ensembles	C.A. Muschik	Phys. Rev. A	Vol. 83, Issue 5	American Physical Society	USA	2011	052312	http://arxiv.org/abs/1007.2209	Yes
111	Spin squeezing of atomic ensembles by multicolor quantum nondemolition measurements	M. Saffman	Physical Review A	Vol. 79, Issue 2	American Physical Society	USA	2009	023831	http://arxiv.org/abs/ 0808.0516	Yes
112	Concentration of measure for quantum states with a fixed expectation value	M. Mueller	Commun. Math. Phys.	303	Springer	Germany	2010	785	http://arxiv.org/abs/1003.4982	Yes
113	A quantum central limit theorem for non-equilibrium systems: Exact local relaxation of correlated	M. Cramer	New J. Phys.	12	IOP	UK	2010	055020	http://arxiv.org/abs/0911.2475	Yes

	states									
114	Gently modulating opto-mechanical systems	A. Mari	Phys. Rev. Lett.	103	APS	USA	2010	213603	http://arxiv.org/abs/0911.0433	Yes
115	Measuring measurement: theory and practice	A. Feito	New J. Phys.	11	IOP	UK	2009	093038	http://arxiv.org/abs/0906.3440	Yes
116	Most quantum states are too entangled to be useful as computational resources	D. Gross	Phys. Rev. Lett.	102	APS	USA	2009	190501	http://arxiv.org/abs/0810.4331	Yes
117	Quantum computational webs	D. Gross	Phys. Rev. A	82	APS	USA	2010	040303(R)	http://arxiv.org/abs/0810.2542	Yes
118	Information propagation through quantum chains with fluctuating disorder	C.K. Burrell	Phys. Rev. A	80	APS	USA	2009	052319	http://arxiv.org/abs/0809.4833	Yes
119	Assessing non-Markovian dynamics	M.M. Wolf	Phys. Rev. Lett.	101	APS	USA	2008	150402	http://arxiv.org/abs/0711.3172	Yes
120	Quantum Margulis expanders	D. Gross	Quant. Inf. Comp.	8	Rinton Press	USA	2008	722	http://arxiv.org/abs/0710.0651	Yes

Section B (confidential)

TEMPLATE B1: LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, ETC.			
Type of IP Rights: Patents, Trademarks, Registered designs, Utility models, etc.	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) (as on the application)

The project did not result in any applications for patents, trademarks, or registered designs.

TEMPLATE B2: OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND					
Exploitable Foreground (description)	**Exploitable product(s) or measure(s)**	**Sector(s) of application**	**Timetable, commercial use**	**Patents or other IPR exploitation (licences)**	**Owner & Other Beneficiary(s) involved**

Due to its scope and nature, the project did not generate any directly exploitable foreground.