Project: FP7-22457 PHASORS

PHase sensitive Amplifier Systems and Optical Regenerator and their applicationS

Project start date: 1st July 2008
Project completion date: 30th June 2011

Publications List 2010

PHASORS project publications 2010

“Experimental investigation of wide bandwidth single and dual pump non-degenerate phase sensitive amplifiers”, J.Kakande, F.Parmigiani, M.Ibsen, P.Petropoulos, D.J.Richardson, OFC/NFOEC 2010 Mar 21-25 2010.

"All-optical phase regeneration of 40Gbit/s DPSK signals in a black-box phase sensitive amplifier" (post-deadline), Francesca Parmigiani, Radan Slavic, Joseph Kakande, Carl Lundström, Martin Sjödin, Peter Andrekson, Ruwan Weerasuriya, Stylianos Sygletos, Andrew D. Ellis, Lars Grüner-Nielsen, D. Jakobsen, S. Herstrøm, Richard Phelan, James O’Gorman, Adonis Bogris, Dimitris Syvridis, Sonali Dasgupta, Periklis Petropoulos, David J. Richardson, Optical Fiber Communication Conference (OFC 2010), San Diego CA, USA, 21-25 March 2010.

"Generation of frequency symmetric signals from a BPSK input for phase sensitive amplification", Ruwan Weerasuriya, Stylianos Sygletos, Selwan K. Ibrahim, Richard Phelan, John O’Carroll, Brian Kelly, James O'Gorman and Andrew D. Ellis, Optical Fiber Communication Conference (OFC 2010), San Diego CA, USA, 21-25 March 2010.

“Dual pump wave generation from ASK-NRZ signal enabling a “black-box” phase sensitive amplifier”, S. Sygletos, S. Ibrahim, R. Weerasuriya, R. Phelan, J. O’Gorman, L.Gruner-Nielsen, A. Bogris, A. D. Ellis, Optical Fiber Communication Conference, paper OWL7, March 2010.

"A novel method of pump and idler signal generation for non-degenerate FWM based phase sensitive amplification", Stylianos Sygletos, Ruwan Weerasuriya, Selwan Ibrahim, Fatima Gunning, Andrew Ellis, Richard Phelan, James O'Gorman, John O’Carroll and Brian Kelly, Conference on Lasers and Electro-Optics (CLEO), San Jose CA, USA, 16-21 May, 2010.

“Synthesis of phase-locked counter-phase modulated pumps for SBS-suppressed fibre parametric amplifiers”, J.Kakande, R.Slavik, F.Parmigiani, P.Petropoulos, D.J.Richardson, CLEO/QELS 2010 San Jose 16-21 May 2010.

“Generation of compressed optical pulses beyond 160 GHz based on two injection-locked CW lasers”, F.Parmigiani, R.Slavik, R.Phelan, P.Petropoulos, J.O.Gorman, D.J.Richardson, CLEO/QELS 2010 San Jose 16-21 May 2010 CTuA3.

“Generation of high repetition rate (>100 GHz) ultrastable pulse trains from a coherent optical beat-signal through non-linear compression using a high SBS-threshold fiber”, F.Parmigiani, R.Slavik, A.Camerlingo, L.Gruner-Nielsen, D.Jakobsen, S.Herstrom, R.Phelan, J.O'Gorman, S.Dasgupta, J.Kakande, S.Sygletos, A.D.Ellis, P.Petropoulos, D.J.Richardson, Nonlinear Photonics 2010 Karlsruhe Germany 21-24 Jun 2010 NThA5.

“Phase locking and carrier extraction schemes for phase sensitive amplification”, Stylianos Sygletos, Ruwan Weerasuriya, Selwan Ibrahim, Fatima Gunning, Richard Phelan, James O'Gorman, John O’Carroll, Brian Kelly, Antonis Bogris, Dimitris Syvridis, Carl Lundström, Peter Andrekson, Francesca Parmigiani, David Richardson, Andrew Ellis, ICTON 2010, June 27- July 1, Munich, Germany.

“Applications of highly nonlinear dispersion tailored lead silicate fibres for high speed optical communications”, F.Parmigiani, A.Camerlingo, X.Feng, F.Poletti, G.M.Ponzo, R.Slavik, P.Horak, M.N.Petrovich, W.H.Loh, P.Petropoulos, D.J.Richardson, ICTON 2010 Munich 27 Jun - 1 Jul 2010 Tu.D2.3 (Invited).

“Multichannel wavelength conversion of 40-Gb/s nonreturn-to-zero DPSK signals in a lead-silicate fiber”, A.Camerlingo, F.Parmigiani, X.Feng, F.Poletti, P.Horak, W.H.Loh, D.J.Richardson, P.Petropoulos, IEEE Photonics Technology Letters 2010 Vol.22(15) pp.1153-1155.

“All-optical signal processing in highly nonlinear fibres”, F.Parmigiani, R.Slavik, J.Kakande, L.Gruner-Nielsen, D.Jakobsen, S.Herstrom, R.Weerasuriya, S.Sygletos, A.D.Ellis, P.Petropoulos, D.J.Richardson, OECC 2010 Sapporo Japan 5-9 Jul 2010 (Invited).

"Generation of ultra-high repetition rate pulses in a highly nonlinear dispersion-tailored compound glass fibre", A.Camerlingo, F.Parmigiani, R.Slavik, X.Feng, F.Poletti, P.Horak, W.H.Loh, P.Petropoulos, D.J.Richardson, IEEE Summer Topicals 2010 Playa del Carmen, Mexico 19-21 Jul 2010.

"Novel carrier extraction scheme for phase modulated signals using feed-forward based modulation stripping", Selwan K. Ibrahim, Stylianos Sygletos, Ruwan Weerasuriya, Andrew D. Ellis, We 7 A4 ECOC 2010

"A Silica Based Highly Nonlinear Fibre with Improved Threshold for Stimulated Brillouin Scattering", L. Grüner-Nielsen, S. Dasgupta, M. D. Mermelstein, D. Jakobsen, S. Herstrøm, M. E. V. Pedersen, E. Leong Lim, S. Alam, F. Parmigiani, D. Richardson, and B. Pálsdóttir, Proceedings of ECOC'10, paper Tu.4.D.3. 2010

"All-Optical Phase-Regenerative Multicasting of 40 Gbit/s DPSK Signal in a Degenerate Phase Sensitive Amplifier", R. Slavík, J. Kakande, F. Parmigiani, L. Grüner-Nielsen, D. Jakobsen, S. Herstrøm, P. Petropoulos, and D. J Richardson,Proceedings of ECOC'10, paper Mo.1.A.2, 2010

"All-Optical Phase and Amplitude Regeneration of a 40Gbit/s DPSK Black-Box Phase Sensitive Amplifier", F. Parmigiani, R. Slavík, J. Kakande, L. Grüner-Nielsen, D. Jakobsen, S. Herstrøm, R. Weerasuriya, S. Sygletos, A. Ellis, P. Petropoulos, and D. J Richardson, Proceedings of ECOC'10, paper Mo.2.A.1, 2010

"Recent Advances in Highly Nonlinear Fibres (invited paper)", D. J Richardson, X. Feng, F. Poletti, S. Dasgupta, A. Camerlingo, F. Parmigiani, P. Petropoulos, W. Loh, S. Herstrøm, and L. Grüner-Nielsen, Proceedings of ECOC'10, paper Tu.4.D.1, 2010

"Saturation Effects In Degenerate Phase Sensitive Fiber Optic Parametric Amplifiers", J. Kakande, F. Parmigiani, R. Slavík, L. Grüner-Nielsen, S. Herstrøm, D. Jakobsen, P. Petropoulos, and D. J Richardson, Proceedings of ECOC'10, paper Th.10.C.2, 2010

"Black-box Optical Regenerator exploiting Non-Degenerate Phase-Sensitive Amplification" Alexandros Fragkos, Adonis Bogris, Dimitris Syvridis, presented at ECOC 2010

"A single-mode, high index-contrast, lead silicate glass fibre with high nonlinearity, broadband near-zero dispersion at telecommunication wavelengths", X.Feng, G.M.Ponzo, F.Poletti, A.Camerlingo, F.Parmigiani, M.N.Petrovich, P.Petropoulos, N.M.White, W.H.Loh, D.J.Richardson, ECOC 2010 Turin 19-23 Sep 2010.

"Detailed characterisation of a fiber-optic parametric amplifier in phase-sensitive and phase-insensitive operation", J.Kakande, C.Lundstrom, P.A.Andrekson, Z.Tong, M.Karlsson, P.Petropoulos, F.Parmigiani, D.J.Richardson, Optics Express 2010 Vol.18 pp.4130-4137.

"Near-zero dispersion, highly nonlinear lead silicate W-type fiber for applications at 1.55μm", A.Camerlingo, X.Feng, F.Poletti, G.M.Ponzo, F.Parmigiani, P.Horak, M.N.Petrovich, P.Petropoulos, W.H.Loh, D.J.Richardson, Optics Express 2010 Vol.18(15) pp.15747-15756.

"Wavelength conversion in a short length of a solid lead-silicate fibre", A.Camerlingo, F.Parmigiani, X.Feng, F.Poletti, P.Horak, W.H.Loh, D.J.Richardson, P.Petropoulos, Photonics Technology Letters 2010 Vol.22(9) pp.628-630.

"Recent advances in highly non-linear microstructured optical fibers for telecoms applications", F.Poletti, X.Feng, A.Camerlingo, P.Petropoulos, W.H.Loh, D.J.Richardson, WSOF Oaxaca Mexico 13-15 Oct 2010 (Invited).

"Noise Properties of Degenerate Dual Pump Phase Sensitive Amplifiers," Adonis Bogris, Dimitris Syvridis, and Costas Efstathiou, IEEE Journal of Lightwave Technology, vol. 28, No. 8, pp. 1209-1217, April 2010.

"Raman Induced Asymmetric Pump Noise Transfer in Fiber Optical Parametric Amplifiers," Zhi Tong, Adonis Bogris, Magnus Karlsson, Peter A. Andrekson, IEEE Photonics Technology Letters, vol. 22, No. 6, pp-386-388, March 2010.

"Full characterization of the signal and idler noise figure spectra in single-pumped fiber optical parametric amplifiers," Zhi Tong, Adonis Bogris, Magnus Karlsson, and Peter A. Andrekson, Optics Express, Vol. 18, Issue 3, pp. 2884-2893, 2010.

"Modeling and measurement of the noise figure of a cascaded non-degenerate phase-sensitive parametric amplifier," Zhi Tong, Adonis Bogris, Carl Lundström, C. J. McKinstrie, Michael Vasilyev, Magnus Karlsson, and Peter A. Andrekson, Optics Express, Vol. 18, Issue 14, pp. 14820-14835 (2010).

"Experimental Characterization of the Phase Squeezing Property of a Phase-sensitive Parametric Amplifiers in Non-degenerate Idler Configuration," Carl Lundström, Benjamin Puttnam, Zhi Tong, Magnus Karlsson and Peter A. Andrekson, *Proceedings of ECOC'2010,* Th.10.C1, Torino, Italy.

"Full Characterization of Noise Figure Spectrum in a Single Pumped Fiber Optical Parametric Amplifiers**,"** Zhi Tong, Adonis Bogris, Magnus Karlsson, Peter Andrekson, *Proceedings of OFC 2010,* OWT5, San Diego, USA.

"Noise Figure Measurement in Phase-Insensitive and Phase-sensitive Fiber Parametric Amplifier Cascade," Zhi Tong, Adonis Bogris, Carl Lundström, Colin McKinstrie, Michael Vasilyev, Magnus Karlsson, Peter Andrekson, *Proceedings of OFC 2010,* OWT4, San Diego, USA.

"Noise Figure Non-reciprocity in Fiber Parametric Amplifiers with Zero-dispersion-wavelength Variations," Zhi Tong, Carl Lundström, Magnus Karlsson, Peter Andrekson, *Proceedings of ECOC'2010*, Th.10.C4, Torino, Italy.

"Noise Performance of Optical Fiber Transmission Links That Use Non-degenerate Cascaded Phase-sensitive Amplifiers," Zhi Tong, Colin McKinstrie, Carl Lundström, Magnus Karlsson, Peter Andrekson, *Optics Express*, vol. 18, n. 15, pp. 15426-15439 (2010).

"Phase-sensitive Amplifiers and Their Applications," Peter. A. Andrekson, Carl Lundström and Zhi Tong, Proceedings of *ECOC'2010,* We.6.E1, (**invited talk**), Torino, Italy.

"Wide Bandwidth Experimental Study of non-Degenerate Phase Sensitive Amplifiers in Single and Dual Pump Configurations", Joseph Kakande, Francesca Parmigiani, Morten Ibsen, Periklis Petropoulos and David J. Richardson, Photonics Technology Letters 2010.

"All-optical phase and amplitude regenerator for next-generation telecommunications systems", Radan Slavík, Francesca Parmigiani, Joseph Kakande, Carl Lundström, Martin Sjödin, Peter Andrekson, Ruwan Weerasuriya, Stylianos Sygletos, Andrew D. Ellis, Lars Grüner-Nielsen, Dan Jakobsen, Søren Herstrøm, Richard Phelan, James O'Gorman, Adonis Bogris, Dimitris Syvridis, Sonali Dasgupta, Periklis Petropoulos, and David J. Richardson, **Nature Photonics, 2010**

"Impact of Zero Dispersion Wavelength Distributions on the Noise Figure Performance of a Fiber Optical Parametric Amplifier," Zhi Tong, Carl Lundström, Magnus Karlsson, Peter Andrekson, Submitting to *IEEE Photonics Technology Letters.*

"Phase-Sensitive Amplified DWDM DQPSK Signals Using Free-Running Lasers with 6-dB Link SNR Improvement over EDFA-based Systems," Zhi Tong, Carl Lundström, Ekawit Tipsuwannakul, Magnus Karlsson and Peter A. Andrekson in *ECOC'2010,* Post-Deadline Paper PDP1-3, Turin, Italy.

"Phase-Sensitive Fiber-Optic Parametric Amplifiers and their Applications," P.A. Andrekson, IEEE Photonics Conference, paper WN4, Denver, USA, November 2010 (invited paper).

"A Silica Based Highly Nonlinear Fibre with Improved Threshold for Stimulated Brillouin Scattering", Lars Grüner-Nielsen, Sonali Dasgupta, Marc D. Mermelstein, Dan Jakobsen, Søren Herstrøm, Martin E. V. Pedersen, Ee Leong Lim, Shaiful-ul Alam, Francesca Parmigiani, David Richardson, and Bera Pálsdóttir;; Proceedings of ECOC'10, paper Tu.4.D.3; 2010

"Dispersion controlled highly nonlinear fibers for all optical processing at telecoms wavelengths", X.Feng, F.Poletti, A.Camerlingo, F.Parmigiani, P.Petropoulos, P.Horak, G.M.Ponzo, M.Petrovich, J.D.Shi, W.H.Loh, D.J.Richardson, , Optical Fiber Technology 2010 Vol.16(6) pp.378-391 Special Fibre Structures and their Applications (Invited)

"Recent advances in highly non-linear microstructured optical fibers for telecoms applications", F.Poletti, X.Feng, A.Camerlingo, P.Petropoulos, W.H.Loh, D.J.Richardson, , WSOF Oaxaca Mexico 13-15 Oct 2010 (Invited)

"Generation of ultra-high repetition rate pulses in a highly nonlinear dispersion-tailored compound glass fibre", A.Camerlingo, F.Parmigiani, R.Slavík, X.Feng, F.Poletti, P.Horak, W.H.Loh, P.Petropoulos, D.J.Richardson, , IEEE Summer Topicals 2010 Playa del Carmen, Mexico 19-21 Jul 2010

"Wide bandwidth experimental study of nondegenerate phase-sensitive amplifiers in single- and dual-pump configurations," J.Kakande, F.Parmigiani, M.Ibsen, P.Petropoulos, D.J.Richardson, *IEEE Photonics Technology Letters* Vol. 22(24) pp.1781-1783, 2010.

"First demonstration of all-optical QPSK signal regeneration in a novel multi-format phase sensitive amplifier," J.Kakande, A.Bogris, R.Slavík, F.Pamigiani, D.Syvridis, P.Petropoulos, D.J.Richardson, *ECOC 2010* Turin 19-23 Sep 2010 PD 3.3 (Postdeadline).

"All-optical phase and amplitude regenerator for next-generation telecommunications systems," R.Slavík, F.Parmigiani, J.Kakande, C.Lundström, M.Sjödin, P.Andrekson, R.Weerasuriya, S.Sygletos, A.D.Ellis, L.Grüner-Nielsen, D.Jakobsen, S.Herstrøm, R.Phelan, J.O'Gorman, A.Bogris, D.Syvridis, S.Dasgupta, P.Petropoulos, D.J.Richardson, *Nature Photonics* Vol.4 pp.690-695, 2010.