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Research Interests

Optical communication, nonlinearity mitigation, nonlinear mathematics, solitons, stochasticity, dynamical systems

Qualifications

MSc, V.N. Karazin Kharkiv National University
Award Date: 10 Mar 2016

BSc, V.N. Karazin Kharkiv National University
Award Date: 30 Jun 2014

Employment

Postgraduate Research , Electrical and Electronic Engineering

College of Engineering and Physical Sciences
1 Jan 2017 → present

Research outputs

Convolutional long short-term memory neural network equalizer for nonlinear Fourier transform-based optical transmission systems

Kotlyar, O., Kamalian-kopae, M., Pankratova, M., Vasylychenkova, A., Prilepsky, J. E. & Turitsyn, S. K., 26 Mar 2021, In: *Optics Express*. 29, 7, p. 11254-11267

Analytical Model of Nonlinear Noise in the B-Modulated Optical Transmission Systems

Derevyanko, S., Shepelsky, D., Pankratova, M., Vasylychenkova, A., Chichkov, N. & Prilepsky, J., 10 Sep 2020, *2020 Conference on Lasers and Electro-Optics, CLEO 2020 - Proceedings*. IEEE, 9192938. (Conference Proceedings - Lasers and Electro-Optics Society Annual Meeting-LEOS; vol. 2020-May).

Full-spectrum periodic nonlinear Fourier transform optical communication through solving the Riemann-Hilbert problem

Kamalian Kopae, M., Vasylychenkova, A., Shepelsky, D., Prilepsky, J. E. & Turitsyn, S. K., 15 Jul 2020, In: *Journal of Lightwave Technology*. 38, 14, p. 3602-3615 14 p., 9027900.

Combining nonlinear Fourier transform and neural network-based processing in optical communications

Kotlyar, O., Pankratova, M., Kamalian-Kopae, M., Vasylychenkova, A., Prilepsky, J. E. & Turitsyn, S. K., 1 Jul 2020, In: *Optics Letters*. 45, 13, p. 3462-3465 4 p.

Multisymbol periodic nonlinear fourier transform communication

Kamalian-Kopae, M., Vasylychenkova, A., Shepelsky, D., Prilepsky, J. & Turitsyn, S., 30 Jun 2020, *IET Conference Publications: 45th European Conference on Optical Communication (ECOC 2019)*. CP765 ed. IET, (IET Conference Publications; vol. 2019, no. CP765).

Nonlinear Fourier Spectrum Characterization of Time-Limited Signals

Shepelsky, D., Vasylychenkova, A., Prilepsky, J. E. & Karpenko, I., 31 May 2020, In: *IEEE Transactions on Communications*. 68, 5, p. 3024-3032 9 p., 8993706.

Signal-Noise Interaction in Optical-Fiber Communication Systems Employing Nonlinear Frequency-Division Multiplexing

Pankratova, M., Vasylychenkova, A., Derevyanko, S., Chichkov, N. B. & Prilepsky, J. E., 8 May 2020, In: *Physical Review Applied*. 13, 5, 054021 .

Artificial neural network-based equaliser in the nonlinear Fourier domain for fibre-optic communication applications
Kamalian-Kopae, M., Vasylychenkova, A., Kotlyar, O., Pankratova, M., Prilepsky, J. & Turitsyn, S., 17 Oct 2019, *2019 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference, CLEO/Europe-EQEC 2019*. IEEE, 8871832

Combining the Discrete NFT Spectrum with B-Modulation for High-Efficiency Optical Transmission
Vasylychenkova, A., Prilepsky, J. E., Chichkov, N. B. & Turitsyn, S. K., 17 Oct 2019, *2019 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference, CLEO/Europe-EQEC 2019*. IEEE, 8872342

Signal-dependent noise for b-modulation NFT-based transmission
Vasylychenkova, A., Pankratova, M., Prilepsky, J. E., Chichkov, N. B. & Turitsyn, S. K., 17 Oct 2019, *2019 Conference on Lasers and Electro-Optics Europe and European Quantum Electronics Conference, CLEO/Europe-EQEC 2019*. IEEE, 8872660

Noise-induced signal corruption in nonlinear Fourier-based optical transmission system in the presence of discrete eigenvalues
Pankratova, M., Vasylychenkova, A. & Prilepsky, J. E., 26 Jul 2019, p. 264-270. 7 p.

On the rigorous justification of b-modulation method and inclusion of discrete eigenvalues
Shepelsky, D., Vasylychenkova, A., Prilepsky, J. E. & Karpenko, I., 2 Jul 2019.

Artificial Neural Network-Based Equaliser in the Nonlinear Fourier Domain for Fibre-Optic Communication Applications
Kamalian Kopae, M., Vasylychenkova, A., Kotlyar, O., Pankratova, M., Prilepsky, J. E. & Turitsyn, S. K., 23 Jun 2019. 1 p.

Study of Noise-Induced Signal Corruption for Nonlinear Fourier-Based Optical Transmission
Pankratova, M., Vasylychenkova, A., Prilepsky, J. E. & Derevyanko, S. A., 4 Mar 2019, *2018 British and Irish Conference on Optics and Photonics, BICOP 2018 - Proceedings*. IEEE, 8658308

Unsupervised and supervised machine learning for performance improvement of NFT optical transmission
Kotlyar, O., Pankratova, M., Kamalian Kopae, M., Vasylychenkova, A., Prilepsky, J. E. & Turitsyn, S. K., 4 Mar 2019, *2018 British and Irish Conference on Optics and Photonics, BICOP 2018 - Proceedings*. IEEE, 8658274

Direct nonlinear Fourier transform algorithms for the computation of solitonic spectra in focusing nonlinear Schrödinger equation
Vasylychenkova, A., Prilepsky, J. E., Shepelsky, D. & Chattopadhyay, A., 1 Mar 2019, In: *Communications in Nonlinear Science and Numerical Simulation*. 68, p. 347-371 25 p.

Communication system based on periodic nonlinear Fourier transform with exact inverse transformation
Kamalian Kopae, M., Vasylychenkova, A., Prilepsky, J. E., Shepelsky, D. & Turitsyn, S. K., 15 Nov 2018, *2018 European Conference on Optical Communication (ECOC)*. IEEE

Communication System Using Periodic Nonlinear Fourier Transform Based on Riemann-Hilbert Problem
Kamalian Kopae, M., Shepelsky, D., Vasylychenkova, A., Prilepsky, J. E. & Turitsyn, S. K., 15 Nov 2018, *2018 European Conference on Optical Communication (ECOC)*. IEEE, 8535439

Signal modulation and processing in nonlinear fibre channels by employing the Riemann-Hilbert problem
Kamalian, M., Vasylychenkova, A., Shepelsky, D., Prilepsky, J. E. & Turitsyn, S. K., 19 Oct 2018, (E-pub ahead of print) In: *Journal of Lightwave Technology*.

Properties of the effective noise in the nonlinear Fourier transform-based transmission
Pankratova, M., Vasylychenkova, A., Prilepsky, J. E. & Derevyanko, S. A., 16 Sep 2018, *Frontiers in Optics / Laser Science: OSA Technical Digest (Optical Society of America, 2018)*. JW3A.83

Contour integrals for numerical computation of discrete eigenvalues in the Zakharov–Shabat problem

Vasylichenkova, A., Prilepsky, J. E. & Turitsyn, S. K., 27 Jul 2018, In: Optics Letters. 43, 15, p. 3690-3693 4 p.

Classical mechanics approach applied to analysis of genetic oscillators

Vasylichenkova, A., Mraz, M., Zimic, N. & Moskon, M., 1 May 2017, In: IEEE/ACM Transactions on Computational Biology and Bioinformatics . 14, 3, p. 721-727 7 p., 7447719.