

List of publications

Books

"From Atomic to Mesoscale: The Role of Quantum Coherence in Systems of Various Complexities," Svetlana A. Malinovskaya and Irina Novikova (editors), World Scientific, 2015.

Papers published or accepted to refereed journals

1. Demetrious T. Kutzke, Owen Wolfe, Simon M. Rochester, Dmitry Budker, Irina Novikova, Eugeny E. Mikhailov, "Tailorable Dispersion in a Four-Wave Mixing Laser," *Optics Letters* **42**, 2846-2849 (2017).
2. Mi Zhang, Melissa A. Guidry, R. Nicholas Lanning, Zhihao Xiao, Jonathan P. Dowling, Irina Novikova, Eugeny E. Mikhailov, "Multi-pass configuration for Improved Squeezed Vacuum Generation in Hot Rb Vapor," *Phys. Rev. A* **96**, 013835 (2017).
3. R. Nicholas Lanning, Zhihao Xiao, Mi Zhang, Irina Novikova, Eugeny E. Mikhailov, Jonathan P. Dowling, "Gaussian-beam-propagation theory for nonlinear optics involving an analytical treatment of orbital-angular-momentum transfer," *Phys. Rev. A* **96**, 013839 (2017).
4. Zhihao Xiao, R. Nicholas Lanning, Mi Zhang, Irina Novikova, Eugeny E. Mikhailov, Jonathan P. Dowling, "Why a hole is like a beam splitter--a general diffraction theory for multimode quantum states of light," arXiv: 1703.03818, accepted to *Phys. Rev. A* (2017).
5. Alexander M. Akulshin, Irina Novikova, Eugeny E. Mikhailov, Sergey A. Suslov, Russell J. McLean, "Arithmetic with optical topological charged in step-wise excited Rb vapour," *Optics Letters* **41**, 1146-1149 (2016).
6. Elena Kuchina, Eugeny E. Mikhailov, Irina Novikova, "Effect of atomic diffusion on the Raman-Ramsey CPT resonances," *Journal of American Optical Society B*, **33**, 610-614 (2016).
7. Mi Zhang, R. Nicholas Lanning, Zhihao Xiao, Jonathan P. Dowling, Irina Novikova, Eugeny E. Mikhailov, "Atom-Generated Spatial Multi-Mode Structure of Squeezed Light," *Physical Review A* **93**, 013853 (2016).
8. Gleb Romanov, Chris O'Brien, Irina Novikova, "Suppression of the four-wave mixing amplification via Raman absorption," *Journal of Modern Optics*, DOI 10.1080/09500340.2015.1133856 (2016).
9. M. Rodriguez-Vega, M. T. Simons, E. Radue, S. Kittiwatanakul, J. Lu, S. A. Wolf, R. A. Lukaszew, I. Novikova, and E. Rossi, "Effect of inhomogeneties and substrate on the dynamics of the metal-insulator transition in VO₂ thin films," *Phys. Rev. B* **92**, 115420 (2015).
10. I. Novikova, E. E. Mikhailov, and Y. Xiao, "Excess optical quantum noise in atomic sensors," *Physical Review A* **91**, 051804(R) (2015).
11. A. M. Akulshin, R. J. McLean, E. E. Mikhailov, and I. Novikova, "Distinguishing nonlinear processes in atomic media via orbital angular momentum transfer," *Optics Letters* **40**, 1109-1112 (2015).
12. E. Radue, L. Wang, S. Kittiwatanakul, J. Lu, S.A. Wolf, E. Rossi, R.A. Lukaszew, I. Novikova, "Substrate-induced microstructure effects on the dynamics of the photo-induced Metal-insulator transition in VO₂ thin films," *J. Optics* **17**, 025503 (2015).
13. E.E. Mikhailov, J. Evans, D. Budker, S.M. Rochester, and I. Novikova, "Four-wave mixing in a ring cavity," *Opt. Eng.* **53**(10), 102709 (2014).
14. G. Romanov, T. Horrom, I. Novikova, E.E. Mikhailov, "Propagation of a squeezed optical field in the medium with superluminal group velocity," *Optics Letters* **39**, 1093-1096 (2014).
15. L. Wang, I. Novikova, J. M. Klopff, S. Madaras, E. Madaras, G. P. Williams, J. Lu, S. Wolf and R. A. Lukaszew, "Distinct Length Scales in the VO₂ Metal-Insulator Transition Revealed by Bi-chromatic Optical Probing," *Adv. Opt. Materials* **2**, 30-33 (2014).
16. M. Zhang, J. Soutanis, I. Novikova, E.E. Mikhailov, "Generating squeezed vacuum field with non-zero angular momentum," *Optics Letters* **38**, 4833 (2013).
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18. N. B. Phillips, I. Novikova, E.E. Mikhailov, D. Budker, S.M. Rochester, "Controllable steep dispersion with gain in a four-level N-scheme with four-wave mixing," *Journal of Modern Optics* **60**, 64-72 (2013).
19. T. Horrom, G. V. Romanov, I. Novikova, and E.E. Mikhailov, "All-atomic generation and noise-quadrature filtering of squeezed vacuum in hot Rb vapor," *Journal of Modern Optics* **60**, 43-49 (2013).
20. L. Wang, E. Radue, S. Kittiwatanaku, C. Clavero, J. Lu, S. A. Wolf, I. Novikova, and R. A. Lukaszew, "Surface plasmon polaritons in VO₂ thin films for tunable low-loss plasmonic applications," *Optics Letters* **37**, 4335-4337 (2012).
21. I. Novikova, R. L. Walsworth, and Y. Xiao, "EIT-based slow and stored light in warm atoms," *Laser & Photonics Reviews*, **6**, 333-353 (2012).

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27. N. B. Phillips, A. V. Gorshkov, and I. Novikova, "Light storage in an optically thick atomic ensemble under conditions of electromagnetically induced transparency and four-wave mixing," *Physical Review A* **83**, 063823 (2011).
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36. Y. Xiao, I. Novikova, D F. Phillips, and R.L. Walsworth, "Repeated interaction model for diffusion-induced Ramsey narrowing," *Optics Express* **16**, 14128-14141 (2008).
37. N. B. Phillips, A. V. Gorshkov, and I. Novikova "Optimal light storage in atomic vapor," *Physical Review A* **78**, 023801 (2008).
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44. Y. Xiao, I. Novikova, D Phillips, and R.L. Walsworth, "Diffusion-induced Ramsey narrowing," *Physical Review Letters* **96**, 043601 (2006).
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Preprints and manuscripts in preparation

1. Nikunj Prajapati, Gleb Romanov, Irina Novikova, "Suppression of Four-Wave Mixing in Hot Rubidium Vapor Using Ladder Scheme Raman Absorption," arXiv:1706.03801 (2017)
2. M. A. Guirdy, E. Kuchina, I. Novikova and E. E. Mikhailov, "Characterization of frequency stability in EIT-based atomic clocks using a differential detection scheme," arXiv:1707.04069 (2017)
3. V.V. Yashchuk, E. Mikhailov, I. Novikova, D. Budker, D. F. Kimball, and M. Zolotarev, "Nonlinear magneto-optical rotation with separated light fields in ⁸⁵Rb vapor contained in an anti-relaxation coated cell," preprint LBNL-44762 (1999).

Conference proceedings

1. I. Novikova, E. E. Mikhailov, Logan Stagg, D. Budker and S. Rochester, "Tunable lossless slow and fast

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 5. M. Klein, Y. Xiao, A. V. Gorshkov, M. Hohensee, C. D. Leung, M. R. Browning, D. F. Phillips, I. Novikova and R. L. Walsworth, "Optimizing slow and stored light for multidisciplinary applications," Proc. of SPIE **6904**, 69040C1 (2008).
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Miscellaneous

1. I. Novikova, "Staying focused," Physics **2**, 7 (2009).
2. D. Toback, A. Mershin, and I. Novikova, "New Pedagogy for Using Internet-Based Teaching Tools in Physics," *The Physics Teacher* **43**, 594-597 (2005).
3. A.V. Milkov, R. Sassen, I. Novikova, E. Mikhailov, "Gas hydrate stability at minimum water depth in the Gulf of Mexico: Significance to geohazard assessment," *Gulf Coast Association of Geological Societies Transactions*, **50**, 217-224 (2000).