

Irina Novikova, Ph.D.

List of publications

Papers published or accepted to refereed journals

1. I. Novikova, N. B. Phillips, and A. V. Gorshkov "Optimal light storage with full pulse shape control," *Physical Review A* **78**, 021802(R) (2008).
2. Y. Xiao, I. Novikova, D. Phillips, and R.L. Walsworth, "Repeated interaction model for diffusion-induced Ramsey narrowing," *Optics Express* **16**, 14128-14141 (2008).
3. N. B. Phillips, A. V. Gorshkov, and I. Novikova "Optimal light storage in atomic vapor," *Physical Review A* **78**, 023801 (2008).
4. E. E. Mikhailov and I. Novikova, "Low-frequency vacuum squeezing via polarization self-rotation in Rb vapor," *Optics Letters* **33**, 1213-1215 (2008).
5. I. Novikova, D.F. Phillips, and R.L. Walsworth, "Slow light with integrated gain and large pulse delay," *Physical Review Letters* **99**, 173604 (2007).
6. I. Novikova, A.V. Gorshkov, D.F. Phillips, A.S. Sørensen, M.D. Lukin, and R.L. Walsworth, "Optimal control of light pulse storage and retrieval," *Physical Review Letters* **98**, 243602 (2007).
7. I. Novikova, D.F. Phillips, A.S. Zibrov, R.L. Walsworth, A.V. Taichenachev, and V.I. Yudin, "Comparison of ^{87}Rb N -resonances for the D_1 and D_2 transitions," *Optics Letters* **31**, 2353-2355 (2006).
8. M. Klein, I. Novikova, D.F. Phillips, and R.L. Walsworth, "Slow light in paraffin-coated Rb vapor cells," *Journal of Modern Optics* **53**, 2583-2591 (2006).
9. I. Novikova, D.F. Phillips, A.S. Zibrov, R.L. Walsworth, A.V. Taichenachev, and V.I. Yudin, "Cancellation of light-shifts in an N -resonance clock," *Optics Letters* **31**, 622-624 (2006).
10. Y. Xiao, I. Novikova, D. Phillips, and R.L. Walsworth, "Diffusion-induced Ramsey narrowing," *Physical Review Letters* **96**, 043601 (2006).
11. A. S. Zibrov, and I. Novikova, "Observation of polarization quantum noise of laser radiation in Rb vapor cell," *Pis'ma v ZhETF* **82**, 124-128 (2005); *JETP Letters* **82**, 110-114 (2005).
12. S. Zibrov, I. Novikova, D. F. Phillips, V.A. Taichenachev, V.I. Yudin, R.L. Walsworth, and A.S. Zibrov, "Three-photon-absorption resonance for all-optical atomic clocks," *Physical Review A* **72**, 011801(R) (2005).
13. I. Novikova, Y. Xiao, D. F. Phillips, and R.L. Walsworth, "EIT and diffusion of atomic coherence," *Journal of Modern Optics* **52**, 2381 - 2390 (2005).
14. D.F. Phillips, I. Novikova, C.Y.-T. Wang, M. Crescimanno and R.L. Walsworth, "Modulation induced frequency shifts in a coherent-population-trapping-based atomic clock," *Journal of the Optical Society of America B* **22**, 305-310 (2005).
15. I. Novikova, A.B. Matsko and G.R. Welch, "Influence of a buffer gas on nonlinear magneto-optical polarization rotation," *Journal of the Optical Society of America B* **22**, 44-56 (2005).
16. E.E. Mikhailov, I. Novikova, Y.V. Rostovtsev, G.R. Welch, "Buffer-gas induced absorption resonances in Rb vapor," *Physical Review A* **70**, 033806 (2004).
17. I. Novikova, A.S. Zibrov, D.F. Phillips, A. Andre and R.L. Walsworth, "Dynamic optical bistability in resonantly enhanced Raman generation," *Physical Review A* **69**, 061802 (2004).
18. E.E. Mikhailov, V.A. Sautenkov, I. Novikova and G.R. Welch, "Large negative and positive delay of optical pulses in coherently prepared dense Rb vapor with buffer gas," *Physical Review A* **69**, 063808 (2004).
19. A.B. Matsko, I. Novikova, M. S. Zubairy, G.R. Welch, "Nonlinear magneto-optical rotation of elliptically polarized light," *Physical Review A* **67**, 043805 (2003).
20. A.B. Matsko, I. Novikova, G.R. Welch, M.S. Zubairy, "Enhancement of Kerr nonlinearity via multi-photon coherence," *Optics Letters* **28**, 96-98 (2003).
21. I. Novikova, A.B. Matsko, G.R. Welch, "Large polarization self-rotation in rubidium vapor: application for

squeezing of electromagnetic vacuum," *Journal of Modern Optics* **49**, 2565 (2002).

22. A.B. Matsko, I. Novikova, G.R. Welch, D. Budker, D. F. Kimball, S. M. Rochester, "Vacuum squeezing in atomic media with self-rotation," *Physical Review A* **66**, 043815 (2002).
23. I. Novikova, A.B. Matsko, G.R. Welch, "Detection of non-resonant impurity gases in alkali vapor cells," *Applied Physics Letters* **81**, 193-195 (2002).
24. I. Novikova, G.R. Welch, "Magnetometry in dense coherent media", *Journal of Modern Optics* **49**, 349-358 (2002).
25. A.B. Matsko, I. Novikova, G.R. Welch, "Radiation trapping under conditions of Electromagnetically Induced Transparency," *Journal of Modern Optics* **49**, 367-378 (2002).
26. A.B. Matsko, I. Novikova, M.O. Scully, G.R. Welch, "Radiation trapping in Coherent Media," *Physical Review Letters* **87**, 133601 (2001).
27. S. Zibrov, I. Novikova, and A.B. Matsko, "Observation of Ramsey fringes in an atomic cell with buffer gas," *Optics Letters* **26**, 1311 - 1313 (2001).
28. I. Novikova, A.B. Matsko, G.R. Welch, "Large polarization rotation via atomic coherence," *Optics Letters* **26**, 1016-1018 (2001).
29. I. Novikova, A.B. Matsko, V.L. Velichansky, G.R. Welch, M. O. Scully, "Compensation of ac-Stark shifts in optical magnetometry," *Physical Review A* **63**, 063802 (2001).
30. I. Novikova, A.B. Matsko, V.A. Sautenkov, V.L. Velichansky, G.R. Welch, M.O. Scully, "Ac-Stark shifts in the non-linear Faraday effect," *Optics Letters* **25**, 1651-1653 (2000).
31. V.A. Sautenkov, M.D. Lukin, C.J. Bednar, I. Novikova, E. Mikhailov, M. Fleischhauer, V.L. Velichansky, G.R. Welch, and M.O. Scully, "Enhancement of magneto-optic effects via large atomic coherence in optically dense media," *Physical Review A* **62**, 023810 (2000).

Preprints and manuscripts in preparation

1. N. Belcher, E.E. Mikhailov, and I. Novikova, "Atomic Clocks and Coherent Population Trapping: Experiments for Undergraduate Laboratories," E-archive arXiv:0810.2071, submitted to *American Journal of Physics* (2008).
2. I. Novikova, A. Khanbekyan, D. Sarkisyan, and G.R. Welch, "Nonlinear magneto-optical effects in Ba vapor," E-archive physics/0408123 (2004).
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 ^{85}Rb vapor contained in an anti-relaxation coated cell," preprint LBNL-44762 (1999).

Conference proceedings

1. 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).
2. I. Novikova, Alexey V. Gorshkov, David F. Phillips, Yanhong Xiao, Mason Klein, and R. L. Walsworth, "Optimization of slow and stored light in atomic vapor." Proc. of SPIE, **6482**, 64820M-1 (2007).
3. D.F. Phillips, I. Novikova, S. Zibrov, C. Smallwood, A.V. Taichenachev, V.I. Yudin, R. L. Walsworth, and A.S. Zibrov, "A Novel Absorption Resonance for Atomic Clocks," Proc. 2005 Joint IEEE Int. Freq. Contr. Symp. and Precise Time and Time Interval (PTTI) Syst. and Appl. Meeting, 767-773 (2006).
4. I. Novikova, M. Klein, D. F. Phillips, and R. L. Walsworth, "Optimizing stored light efficiency in vapor cells," Proc. SPIE International Symposium Integrated Optoelectronic Devices, **5735**, 87-97 (2005).

Miscellaneous

1. D. Toback, A. Mershin, and I. Novikova, "New Pedagogy for Using Internet-Based Teaching Tools in Physics," *The Physics Teacher* **43**, 594-597 (2005).
2. 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).