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EDUCATION

Ph. D. in Electrical Engineering, Stanford University, Stanford, CA (December 2003).

Dissertation title: A Raman Approach for Generating Ultrashort Pulses.

Dissertation advisor: Professor Steve E. Harris.

Dissertation committee: Professors Steve E. Harris, Martin M. Fejer, and Olav Solgaard.

M. S. in Electrical Engineering, Stanford University, Stanford, CA (June 1999).

B. S. in Electrical Engineering, Bilkent University, Ankara, Turkey (June 1997).

EMPLOYMENT

Assistant Professor, September 2006-present.

Department of Physics, University of Wisconsin at Madison, Madison, WI.

Postdoctoral Research Associate, January 2004 - August 2006.

Department of Physics, University of Wisconsin at Madison, Madison, WI.

Supervisors: Professors Mark Saffman and Thad G. Walker.

Graduate Student Researcher, January 1998 - December 2003.

Department of Electrical Engineering, Stanford University, Stanford, CA.

Supervisor: Professor Steve E. Harris.

Graduate Student Researcher, September 1997 - December 1997.

Department of Electrical Engineering, Stanford University, Stanford, CA.

Supervisor: Professor Pierre T. Khuri-Yakub.

RESEARCH INTERESTS

Ultrafast physics:

- Generation and characterization of sub-femtosecond optical pulses.
- Applications of ultrashort pulses to precision spectroscopy and coherent control.
- Arbitrary waveform generation in femtosecond time scales, schemes for realizing a pentahertz (10^{15} Hz) function generator.

Coherent effects using Electromagnetically Induced Transparency:

- Refractive index enhancement using quantum interference in optically driven systems.
- Electromagnetically Induced Transparency with large bandwidth laser pulses.

- Nonlinear optics at single photon levels, single photon gates.
- Spatial and temporal solitons in coherently driven atomic and molecular systems.

JOURNAL PUBLICATIONS

1. A. V. Sokolov, **D. D. Yavuz**, and S. E. Harris, “*Subfemtosecond Pulse Generation by Rotational Molecular Modulation*”, Opt. Lett. **24**, 557 (1999).
2. **D. D. Yavuz**, A. V. Sokolov, and S. E. Harris, “*Eigenvectors of a Raman Medium*”, Phys. Rev. Lett. **84**, 75 (2000).
3. A. V. Sokolov, D. R. Walker, **D. D. Yavuz**, G. Y. Yin, and S. E. Harris, “*Raman Generation by Phased and Anti-Phased Molecular States*”, Phys. Rev. Lett. **85**, 562 (2000).
4. A. V. Sokolov, **D. D. Yavuz**, D. R. Walker, G. Y. Yin, and S. E. Harris, “*Light Modulation at Molecular Frequencies*”, Phys. Rev. A. **63**, 051801(R) (2001).
5. A. V. Sokolov, D. R. Walker, **D. D. Yavuz**, G. Y. Yin, and S. E. Harris, “*Femtosecond Light Source for Phase-Controlled Multi-Photon Ionization*”, Phys. Rev. Lett. **87**, 033402 (2001).
6. S. E. Harris, A. V. Sokolov, D. R. Walker, **D. D. Yavuz**, and G. Y. Yin, “*Collinear Light Scattering Using Electromagnetically Induced Transparency*”, in Atomic Physics **17**, pp. 189-203, edited by E. Arimondo, P. DeNatale, and M. Inguscio (2001).
7. A. V. Sokolov, Scott Sharpe, M. Y. Shverdin, D. R. Walker, **D. D. Yavuz**, G. Y. Yin, and S. E. Harris, “*Optical Frequency Conversion by a Rotating Molecular Waveplate*”, Opt. Lett. **26**, 728 (2001).
8. S. E. Harris, A. V. Sokolov, D. R. Walker, **D. D. Yavuz**, and G. Y. Yin, “*Raman Technique for Femtosecond Pulse Generation*”, in Laser Physics at the Limit, pp. 355-365, edited by H. Figger, D. Meschede, and C. Zimmerman (2002).
9. S. E. Harris, D. R. Walker, and **D. D. Yavuz**, “*Raman Technique for Single Cycle Pulses*”, Phys. Rev. A **65**, 021801(R) (2002).
10. **D. D. Yavuz**, D. R. Walker, G. Y. Yin, and S. E. Harris, “*Rotational Raman Generation with Near Unity Conversion Efficiency*”, Opt. Lett. **27**, 769 (2002).
11. D. R. Walker, **D. D. Yavuz**, M. Y. Shverdin, G. Y. Yin, A. V. Sokolov, and S. E. Harris, “*Raman Self-Focusing at Maximum Coherence*” Opt. Lett. **27**, 2094 (2002).
12. **D. D. Yavuz**, D. R. Walker, and M. Y. Shverdin, “*Spatial Raman Solitons*”, Phys. Rev. A **67**, 041803(R) (2003).
13. D. R. Walker, **D. D. Yavuz**, M. Y. Shverdin, G. Y. Yin, and S. E. Harris, “*A Quasi-periodic Approach for Femtosecond Pulse Generation*”, Optics and Photonics News **47**, 46 (2003).
14. **D. D. Yavuz**, D. R. Walker, M. Y. Shverdin, G. Y. Yin, and S. E. Harris, “*Quasi-periodic Raman Technique for Ultrashort Pulse Generation*”, Phys. Rev. Lett. **91**, 233602 (2003).

15. M. Y. Shverdin, **D. D. Yavuz**, and D. R. Walker, “*(2+1)D Stable Spatial Raman Solitons*”, Phys. Rev. A **69**, 031801(R) (2004).
16. **D. D. Yavuz**, “*Elimination of Feshbach Loss in a Bose-Einstein Condensate*”, Opt. Commun. **234**, 253 (2004).
17. A. V. Sokolov, M. Y. Shverdin, D. R. Walker, **D. D. Yavuz**, A. M. Burzo, G. Y. Yin, and S. E. Harris, “*Generation and Control of Femtosecond Pulses by Molecular Modulation*”, J. Mod. Opt. **52**, 285 (2005).
18. M. Y. Shverdin, D. R. Walker, **D. D. Yavuz**, G. Y. Yin, and S. E. Harris, “*Generation of a Single-Cycle Optical Pulse*”, Phys. Rev. Lett. **94**, 033904 (2005).
19. M. Y. Shverdin, D. R. Walker, **D. D. Yavuz**, S. Goda, G. Y. Yin, and S. E. Harris, “*The Ultrafast Physics at the Frontier*”, Photonics Spectra **39**, 92 (2005).
20. **D. D. Yavuz**, “*Single Photon Swap Gate Using Electromagnetically Induced Transparency*”, Phys. Rev. A **71**, 053816 (2005).
21. **D. D. Yavuz**, “*Refractive Index Enhancement in a Far-off Resonant Atomic System*”, Phys. Rev. Lett. **95**, 223601 (2005).
22. **D. D. Yavuz**, P. B. Kulatunga, E. Urban, T. A. Johnson, N. Proite, T. Henage, T. G. Walker, and M. Saffman, “*Fast Ground State Manipulation of Neutral Atoms in Microscopic Optical Traps*”, Phys. Rev. Lett. **96**, 063001 (2006).
23. **D. D. Yavuz**, “*Femtosecond All-Optical Switch Using Two-photon Absorption*”, Phys. Rev. A **74**, 053804 (2006).
24. **D. D. Yavuz**, “*Electromagnetically Induced Transparency with Broadband Laser Pulses*”, Phys. Rev. A, Rapid Communications (accepted for publication).
25. **D. D. Yavuz**, “*Spatial Raman Solitons in Far-off Resonant Atomic Systems*”, Phys. Rev. A (submitted for publication).
26. **D. D. Yavuz**, “*Nanoscale Resolution Fluorescence Microscopy Using Cold Atoms*” (in preparation).

PRESENTATIONS

Invited Talks

- Optical Society of America, student chapter weekly seminar, Stanford University, Stanford, CA (October 1999).
“*Eigenvectors of a Raman Medium*”.
- 30th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT (January 2000).
“*Eigenvectors of a Raman Medium*”.
- 31th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT (January 2001).
“*Raman Technique for Single Cycle Pulses*”.

- 2001 Workshop on Laser Physics and Quantum Optics, Jackson Hole, WY (August 2001).
“*Femtosecond Light Source for Phase Controlled Multi-Photon Ionization*”.
- Atomic Physics Seminar, Department of Physics, University of Wisconsin at Madison, Madison, WI (April 2003).
“*A Raman Approach for Generating Ultrashort Pulses*”.
- Atomic Physics Seminar, Department of Physics, University of California at Berkeley, Berkeley, CA (April 2003).
“*A Raman Approach for Generating Ultrashort Pulses*”.
- Department of Electrical Engineering, Bilkent University, Ankara, Turkey (July 2003).
“*A Raman Approach for Generating Ultrashort Pulses*”.
- 12th International Laser Physics Workshop, Hamburg, Germany (August 2003).
“*A Quasi-periodic Raman Technique for Generating Ultrashort Pulses*”.
- Quantum Electronics Semiar, Department of Applied Physics, Stanford University, Stanford, CA (October 2003).
“*A Raman Approach for Generating Ultrashort Pulses*”.
- Atomic Physics Seminar, Department of Physics, University of Wisconsin at Madison, Madison, WI (January 2005).
“*Generating Sub-femtosecond Optical Pulses*”.
- Midwestern Cold Atom Workshop, University of Illinois at Urbana-Champaign, Urbana, IL (November 2005).
“*Quantum Computing with Trapped Neutral Atoms*”.
- Department of Electrical Engineering, Bilkent University, Ankara, Turkey (January 2006).
“*Generating Sub-femtosecond Optical Pulses*”.
- Department of Physics, Bilkent University, Ankara, Turkey (January 2006).
“*Quantum Computing with Trapped Neutral Atoms*”.
- Department of Physics, University of Wisconsin at Madison, Madison, WI (January 2006).
“*Quantum Computing with Trapped Neutral Atoms*”.
- Department of Physics, University of Oregon at Eugene, Eugene, OR (February 2006).
“*Quantum Computing with Trapped Neutral Atoms*”.
- Department of Physics, University of Nebraska at Lincoln, Lincoln, NE (February 2006).
“*Quantum Computing with Trapped Neutral Atoms*”.
- Department of Physics, Massachusetts Institute of Technology, Cambridge, MA (March 2006).
“*Quantum Computing with Trapped Neutral Atoms*”.

- Department of Physics, Texas A & M University, College Station, TX (April 2006).
“*Quantum Computing with Trapped Neutral Atoms*”.
- 37th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT (January 2007).
“*All-Optical Femtosecond Switch Using Two-photon Absorption*”.

Contributed Talks and Posters

- Gordon Research Conference on Quantum Control of Atomic and Molecular Motion, Plymouth, NH (August 1999).
“*Eigenvectors of a Raman Medium*”.
- Optical Society of America Annual Meeting, Santa Clara, CA (September 1999).
“*Eigenvectors of a Raman Medium*”.
- CLEO/QELS 2000, San Francisco, CA (May 2000).
“*Eigenvectors of a Raman Medium*”.
- Optical Society of America Annual Meeting, Long Beach, CA (October 2001).
“*Spatial Soliton Propagation in Multi-sideband Raman Scattering*”.
- 18th International Conference on Atomic Physics, Cambridge, MA (August 2002).
“*Raman Technique for Single Cycle Pulses*”.
- 18th International Conference on Atomic Physics, Cambridge, MA (August 2002).
“*Electromagnetically Induced Transparency for Matter Waves*”.
- Gordon Conference on Quantum Control of Light and Matter, South Hadley, MA (August 2003).
“*Quasi-periodic Raman Technique for Ultrashort Pulse Generation*”.
- DAMOP 2005, annual meeting of American Physical Society, Lincoln, NE (May 2005).
“*Single-Photon Swap Gate Using Electromagnetically Induced Transparency*”.
- DAMOP 2005, Annual Meeting of American Physical Society, Lincoln, NE (May 2005).
“*Loading and Manipulation of Neutral Atoms in Microscopic Dipole Traps*”.
- Gordon Research Conference on Quantum Control of Light and Matter, Waterville, ME (August 2005).
“*Refractive Index Enhancement in a Far-off Resonant Atomic System*”.
- 37th Winter Colloquium on the Physics of Quantum Electronics, Snowbird, UT (January 2007).
“*Electromagnetically Induced Transparency with Broadband Laser Pulses*”.

TEACHING

Instructor, graduate level course “*Lasers*”, Department of Physics, University of Wisconsin at Madison (Spring 2007).

Instructor, graduate level course, “*Electronic Aids to Measurement*”, University of Wisconsin at Madison, (Fall 2006).

Teaching Assistant, graduate level course “*Introduction to Nonlinear Optics*”, Stanford University (Spring 1999, 2000 and 2001).

Teaching Assistant, graduate level course “*Introduction to Atomic Processes*”, Stanford University (Fall 2001).

Volunteer Tutor, free courses on basic word processors and spread sheets given to local high school students, Bilkent University (Spring 1996).