Adnan Doyuran

Post Graduate Research Physicist

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EDUCATION

- State University of New York at Stony Brook, Stony Brook NY

Ph.D. in Physics, degree granted on December 18th 2000.
Accelerator Physics and Free Electron Lasers.

Thesis: High Gain Harmonic Generation Experiment at the BNL- ATF, and SASE Gain As a Function of Electron Beam Parameters

- State University of New York at Stony Brook, Stony Brook NY

M. A. in Accelerator Physics and Free Electron Lasers, December 1997

- United States Particle Accelerator School

Classes:
Fundamentals of Particle Accelerator Physics, June 1997 MIT
Microwave Measurements, June 1998 Stanford University
X-ray Optics, June 1999 Argon National Laboratory
Digital Signal Processing, June 1999 Argon National Laboratory
High Gain Free Electron Lasers, June 2000 SUNY at Stony Brook
Superconductivity for accelerator magnets and RF cavities, June 2000 SUNY at Stony Brook

- Bogazici (Bosphorous) University, Istanbul, TURKEY

B. S. in Physics, June 1994

Graduated as top student among 33 students

- Izmir Science High School, June 1989,
  The Izmir Science High School was one of only five of its type in Turkey, providing strong education in science.

- Ranked 61st student among 1 million students in the post-high-school University Placement Examination in Turkey.

RESEARCH EXPERIENCE

- From January 24, 2004 to current Post Graduate Research Physicist
  UCLA Dept. of Physics and Astronomy
  I am working in the Neptune Laboratory on electron-laser beam interactions.
- From January 24, 2001 to January 24, 2004 Research Associate
  Brookhaven National Laboratory
  National Synchrotron Light Source Department

I have been working on the Deep Ultra Violet Free Electron Laser (DUV FEL) project in the Source Development Laboratory at BNL since January 2001 as a postdoctoral research associate. I worked on design and installation of the optical and electron diagnostic systems on and around the 10 m long NISUS wiggler. These diagnostic systems include the pop-in monitors, detectors, He-Ne laser alignment system, streak camera and autocorrelator for pulse length measurements. I also operated the accelerator extensively during the FEL measurements and the first user experiments. In the first stage of the project, we commissioned the accelerator systems and obtained first lasing of the machine. In the second stage of the experiment, we seeded the FEL at 266 nm using frequency tripled 800 nm Ti-Sapphire laser. Seeded FEL properties were measured. In the third stage of the experiment, High Gain Harmonic Generation (HGHG) was used to produce 266 nm FEL output from an 800 nm Ti-Sapphire laser seeding the electron beam at the modulator section. The properties of the HGHG output were measured successfully and saturation of the FEL has been observed. During the FEL process higher order harmonics of the radiation is also produced. As the first user experiment application the third harmonic of the radiation at 88 nm has been used for a novel ion imaging experiment in chemistry.

I gave an oral presentation about the results of the HGHG experiment at Particle Accelerator Conference in May 2003 in Portland, OR.
I also did some theoretical simulations for the FEL using TDA code developed by L.H. YU and Mathematica Program.

Our work has been publishes in Physical Review letters [Key Pub 3] and Nuclear Instrument and Methods A [Key Pub 4] and some conference Proceedings [Key Pub 5]. I made poster presentations at various Free Electron Laser and Particle Accelerator Conferences.

- From February 1997 to December 2000 Research assistant

During my PhD education I worked as research assistant in Accelerator Test Facility in Brookhaven National Lab on the High-Gain Harmonic-Generation experiment which is method for producing high quality Free Electron Laser (FEL) output. The details of the experiment can be found in my thesis at link below

http://www.bnl.gov/atf/documents/Adnan.html

For the experiment, I learned to operate the accelerator, which has a photocathode electron gun and produces 40 MeV High-brightness electron beam. I was responsible for key electron beam and FEL measurements. I built an autocorrelator for pulse length measurement for the 5.3 micron output laser light. I worked intensively with the spectrometers, detectors at various wavelengths, and I worked on designing and building the transport lines for the input seed CO_2 laser and the FEL output. I established alignment systems using He-Ne laser. Our results have been published in Science magazine [Key Pub 1] and Physical Review Letters [Key Pub 2]. I gave a talk at Free Electron Laser Conference in Durham, NC, in 2000.

TEACHING EXPERIENCE

I have two years of teaching experience at SUNY at Stony Brook as teaching assistant. I taught lab sessions and graded exams. Prior to PhD education I worked as Science and Physics teacher in a high school for three months in Uzbekistan. During my University education I tutored secondary and high school students in Math and Science. I prepared some of them for the National and International Science Olympiads in Turkey.

CERTIFICATIONS

- Teaching Assistant (2 years) at SUNY at Stony Brook, Physics Department
- Physics Teacher (3 Months)
- Trained Electron Beam Accelerator Operator at the Accelerator Test Facility and Source Development Laboratory at BNL
- Trained Laser Operator at the ATF

COMPUTER SKILLS

- Windows, Accelerator Control Systems at the ATF, Accelerator Control Systems at the SDL, MS-DOS, Microsoft Office, Mathcad, Sigma Plot, BeamCad (optical transport program), Transport (electron beam transport program), MAD (electron beam transport program), Mathematica, familiarity with Unix, Lab view and Mathlab programs.

PROFESSIONAL SERVICES

Tutored advanced physics, one-on-one, to high school physics students between 1990 and 1994.

KEY PUBLICATIONS

[1] **HIGH GAIN HARMONIC GENERATION FREE-ELECTRON LASER EXPERIMENT**, L.-H. Yu, M. Babzien, I. Ben-Zvi, L.F. DiMauro, A. Doyuran, W. Graves, E. Johnson, S. Krinsky, R. Malone, I. Pogorelsky, J. Skaritka, G. Rakowsky, L. Solomon, X.J. Wang, M. Woodle, V. Yakimenko (BNL), S.G. Biedron, J.N. Galayda, E.

Gluskin, J. Jagger, V. Sajaev, I. Vasserman (ANL), ***Science*** 2000 August 11; 289: 932-934

[2] **Characterization of a High-Gain Harmonic-Generation Free-Electron Laser at Saturation** A. Doyuran, M. Babzien, T. Shaftan, L. H. Yu, L. F. DiMauro, I. Ben-Zvi, S. G. Biedron, W. Graves, E. Johnson, S. Krinsky, R. Malone, I. Pogorelsky, J. Skaritka, G. Rakowsky, X. J. Wang, M. Woodle, V. Yakimenko, J. Jagger, V. Sajaev, and I. Vasserman, Phys. Rev. Letter, 86, 5902(2001)

[3] **First Ultraviolet High-Gain Harmonic-Generation Free-Electron Laser**
L. H. Yu, L. DiMauro, A. Doyuran, W. S. Graves, E. D. Johnson, R. Heese, S. Krinsky, H. Loos, J. B. Murphy, G. Rakowsky, J. Rose, T. Shaftan, B. Sheehy, J. Skaritka, X. J. Wang, and Z. Wu
Published 14 August 2003, Physical Rev Lett, Vol 91 Issue 7, P 074801-1

[4] **Observation of SASE and amplified seed of the DUV-FEL at BNL,** A. Doyuran, W. Graves, R. Heese, E. D. Johnson, S. Krinsky, H. Loos, J. Murphy, G. Rakowsky, J. Rose,T. Shaftan, B. Sheehy, J. Skaritka, X.J. Wang, L.H. Yu, NIM-A Vol 507, P 392-395, 2003

[5] **SATURATION of THE NSLS DUV-FEL AT BNL**, A. Doyuran, L. DiMauro, W. Graves, R. Heese, E. D. Johnson, S. Krinsky, H. Loos, J.B. Murphy, G. Rakowsky, J. Rose, T. Shaftan, B. Sheehy, Y. Shen, J. Skaritka, X.J. Wang, Z. Wu, L.H. Yu, PAC May 2003 Proceedings, being published.

[6] **Experimental study of a high-gain harmonic-generation free-electron laser in the ultraviolet,** Adnan Doyuran, Louis DiMauro,William Graves,† Richard Heese, Erik D. Johnson, Sam Krinsky, Henrik Loos, James B. Murphy, George Rakowsky, James Rose, Timur Shaftan, Brian Sheehy, Yuzhen Shen, John Skaritka, XijieWang, ZiluWu, and Li Hua Yu.
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HIGH GAIN HARMONIC GENERATION FREE-ELECTRON LASER EXPERIMENT, L.-H. Yu, M. Babzien, I. Ben-Zvi, L.F. DiMauro, A. Doyuran, W. Graves, E. Johnson, S. Krinsky, R. Malone, I. Pogorelsky, J. Skaritka, G. Rakowsky, L. Solomon, X.J. Wang, M. Woodle, V. Yakimenko (BNL), S.G. Biedron, J.N. Galayda, E. Gluskin, J. Jagger, V. Sajaev, I. Vasserman (ANL), ***Science*** 2000 August 11; 289: 932-934

Characterization of a High-Gain Harmonic-Generation Free-Electron Laser at Saturation
A. Doyuran, M. Babzien, T. Shaftan, L. H. Yu, L. F. DiMauro, I. Ben-Zvi, S. G. Biedron, W. Graves, E. Johnson, S. Krinsky, R. Malone, I. Pogorelsky, J. Skaritka, G. Rakowsky, X. J. Wang, M. Woodle, V. Yakimenko, J. Jagger, V. Sajaev, and I. Vasserman, Phys. Rev. Letter, 86, 5902(2001)

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Observation of SASE and amplified seed of the DUV-FEL at BNL, A. Doyuran, W. Graves, R. Heese, E. D. Johnson, S. Krinsky, H. Loos, J. Murphy, G. Rakowsky, J. Rose,T. Shaftan, B. Sheehy, J. Skaritka, X.J. Wang, L.H. Yu, NIM-A Vol 507, P 392-395, 2003

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'Free Electron Laser 2000 Conference' Nucl. Instrum. Meth. **A475** (2001) 260-265.

First Sase and Seeded FEL Lasing of NSLS DUV FEL at 266 and 400 nm, T. Shaftan, L. DiMauro, A. Doyuran, W. Graves, R. Heese, E. D. Johnson, S. Krinsky, H. Loos, J. B. Murphy, G. Rakowsky, J. Rose, B. Sheehy, J. Skaritka, X. J. Wang and L. H. Yu , NIM-A Vol 507, P 15-18, 2003

EXPERIMENTAL CHARACTERIZATION OF EMITTANCE GROWTH INDUCED BY THE NONUNIFORM TRANSVERSE LASER DISTRIBUTION IN A PHOTOINJECTOR F. Zhou, I. Ben-Zvi, M. Babzien, X.Y. Chang, A. Doyuran, R. Malone, X.J. Wang, V. Yakimenko (Brookhaven & UCLA). 2002. 6pp.
Published in Phys.Rev.ST Accel.Beams 5:094203,2002

FIRST LASING OF A HIGH GAIN HARMONIC GENERATION FREE-ELECTRON LASER EXPERIMENT, L.-H. Yu, M. Babzien, I. Ben-Zvi, L.F. DiMauro, A. Doyuran, W. Graves, E. Johnson, S. Krinsky, R. Malone, I. Pogorelsky, J. Skaritka, G. Rakowsky, L. Solomon, X.J. Wang, M. Woodle, V. Yakimenko (BNL), S.G. Biedron, J.N. Galayda, E. Gluskin, J. Jagger, V. Sajaev, I. Vasserman (ANL), Nucl. Instrum. Meth. **A445** (2000) 301.

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Chirped Pulse Amplification of HGHG-FEL at DUV-FEL Facility at BNL
Adnan Doyuran , Louis DiMauro, W. Graves, Richard Heese, Erik D. Johnson, Sam Krinsky, Henrik Loos, James B. Murphy, George Rakowsky, James Rose, Timur Shaftan, Brian Sheehy, Yuzhen Shen, John Skaritka, Xijie Wang, Zilu Wu, Li Hua Yu, Being published in NIM A (FEL 2003 conference Proceedings)

SATURATION of THE NSLS DUV-FEL AT BNL, A. Doyuran, L. DiMauro, W. Graves, R. Heese, E. D. Johnson, S. Krinsky, H. Loos, J.B. Murphy, G. Rakowsky, J. Rose, T. Shaftan, B. Sheehy, Y. Shen, J. Skaritka, X.J. Wang, Z. Wu, L.H. Yu, PAC May 2003 Proceedings

DIAGNOSTICS SYSTEM FOR THE NISUS WIGGLER AND FEL OBSERVATIONS AT THE BNL SOURCE DEVELOPMENT LAB, A. Doyuran, W. Graves, E. Johnson, S. Krinsky, H. Loos, G. Rakowsky, J. Rose, T. Shaftan, B. Sheehy, J. Skaritka, J. Wu, L.H. Yu, Y. Zhau, EPAC June 2002 proceedings

ELECTRON BUNCH COMPRESSION AND COHERENT EFFECTS AT THE SDL. H. Loos, G.L. Carr, A. Doyuran, W.S. Graves, E.D. Johnson, S. Krinsky, J. Rose, B. Sheehy, T.V. Shaftan, J. Skaritka, L.H. Yu (Brookhaven).
Published in AIP Conf.Proc.647:849-857,2003

EMITTANCE GROWTH DUE TO THE LASER NON-UNIFORMITY IN A PHOTOINJECTOR, F. Zhou, BNL/UCLA, Upton, Long Island, New York; M. Babzien, I. Ben-Zvi, X. Chang, A. Doyuran, R. Malone, X. Wang, V. Yakimenko, EPAC June 2002 proceedings

Electron Bunch Compression in SDL Linac, Shaftan, A. Doyuran, W. Graves, E.D. Johnson, S. Krinsky, H. Loos, J. Rose, B. Sheehe, J. Skaritka, J. Wu, L.H. Yu, Z. Yu, BNL-NSLS, Upton, Long Island, New York; L. DiMauro, EPAC June 2002 proceedings

Coherent Synchrotron Radiation Experiments at SDL, H. Loos, A. Doyuran, W. Graves, E.D. Johnson, S. Krinsky, J. Rose, T.V. Shaftan, B. Sheehy, J. Skaritka, J. Wu, L.H. Yu, Z. Yu, EPAC June 2002 proceedings

Beam-based Trajectory Alignment in the NISUS Undulator, T. Shaftan, A. Doyuran, W. Graves, E.D. Johnson, S. Krinsky, H. Loos, J. Rakowsky, J. Rose, B. Sheehy, J. Skaritka, J. Wu, L.H. Yu, Z. Yu, EPAC June 2002 proceedings

Beam-Based Trajectory Alignment in the NISUS Wiggler, T. V. Shaftan, H. Loos, L. F. DiMauro, A. Doyuran, W. S. Graves, E. D. Johnson, S. Krinsky, J. Rakowsky, J. Rose, B. Sheehy, J. Skaritka, J. Wu, L.-H. Yu, Y. Zhao (BNL), FEL September 2002 Proceedings

Bunch Compression in SDL Linac, T. Shaftan, J. Wu, W. Graves, H. Loos, A. Doyuran, L. H. Yu, E. D. Johnson, S. Krinsky, J. Rose, B. Sheehy (BNL); D. H. Dowell (SLAC), FEL September 2002 Preceding

ULTRASHORT ELECTRON BUNCH LENGTH MEASUREMENT AT DUVFEL, W.S. Graves, G.L. Carr, L.F. DiMauro, A. Doyuran, R. Heese, E.D. Johnson, C. Neuman, G. Rakowsky, J. Rose, J. Rudati, T. Shaftan, B. Sheehy, J. Skaritka, L.H. Yu, Proceedings of the 2001 Particle Accelerator Conference, p. 2224

HIGH GAIN HARMONIC GENERATION FREE-ELECTRON LASER AT SATURATION, T. Shaftan, M. Babzien, I. Ben-Zvi, S.G. Biedron, L.F. DiMauro, A. Doyuran, W.S. Graves, j. Jagger, E.D. Johnson, S. Krinsky, r. Malone, I. Pogorelsky, V. Sajaev, B. Sheehy, J. Skaritka, L. Solomon, G. Rakowsky, I. Vasserman, J.H. Wu, X.J. Wang, M. Woodle, V. Yakimenko, L.H. Yu, Proceedings of the 2001 Particle Accelerator Conference, p. 246

THE DUV-FEL DEVELOPMENT PROGRAM, L.H. Yu, L.F. DiMauro, A. Doyuran, W.S. Graves, E.D. Johnson, S. Krinsky, s. Mikhailov, G. Rakowsky, J. Skaritka, T. Shaftan, B. Sheehy, J.H. Wu, Proceedings of the 2001 Particle Accelerator Conference, p. 2830.

MEASURED PROPERTIES OF THE DUVFEL HIGH BRIGHTNESS, ULTRASHORT ELECTRON BEAM, W.S. Graves, G.L. Carr, L.F. DiMauro, A. Doyuran, R. Heese, E.D. Johnson, S. Krinsky, C. Neuman, G. Rakowsky, J. Rose, J. Rothman, J. Rudati, T. Shaftan, B. Sheehy, J. Skaritka, L.H. Yu, Proceedings of the 2001 Particle Accelerator Conference, p. 2860

PHOTON BEAM DIAGNOSTICS FOR VISA FEL, A. Murokh, C. Pellegrini, J. Rosenzweig, P. Frigola, P. Musumeci, A. Tremaine, M. Babzien, I. Ben-Zvi, A. Doyuran, E. Johnson, J. Skaritka, X. J. Wang, K. A. Van Bibber, J. M. Hill, G. P. Le Sage, D. Nguyen, M. Cornacchia, Proceedings of the 1999 Particle Accelerator Conference (A. Luccio, W. MacKay Editors), p. 2840.

THE STATUS OF THE HIGH-GAIN HARMONIC GENERATION FREE-ELECTRON LASER EXPERIMENT AT THE ACCELERATOR TEST FACILITY, L.-H. Yu, M. Babzien, I. Ben-Zvi, A. Doyuran, W. Graves, E. Johnson, S. Krinsky, R. Malone, I. Pogorelsky, J. Skaritka, G. Rakowsky, L. Solomon, X.J. Wang, M. Woodle, V. Yakimenko, S.G. Biedron, J.N. Galayda, V. Sajaev, I. Vasserman, Proceedings of the 1999 Particle Accelerator Conference (A. Luccio, W. MacKay Editors), p. 2471

DIAGNOSTICS AND CORRECTION OF THE ELECTRON BEAM TRAJECTORY IN THE CORNELL WIGGLER AT THE ACCELERATOR TEST FACILITY, V. Sajaev, Li-Hua Yu, A. Doyuran, R. Malone, X. Wang, V. Yakimenko, Proceedings of the 1999 Particle Accelerator Conference (A. Luccio, W. MacKay Editors), p. 2942

Articles in Publication

Superexcited state dynamics probed with an extreme-ultraviolet free electron laser Wen Li,, Robert Lucchese, Adnan Doyuran, Zilu Wu, Henrik Loos, Gregory E. Hall, and Arthur G. Suits*, submitted to Superx-PRL (2003)

Experimental Study of a High-Gain Harmonic-Generation Free-Electron Laser in the Ultraviolet Adnan Doyuran*, Louis DiMauro, William Graves , Richard Heese, Erik D. Johnson, Sam Krinsky, Henrik Loos, James B. Murphy, George Rakowsky, James Rose, Timur Shaftan, Brian Sheehy, Yuzhen Shen, John Skaritka, Xijie Wang, Zilu Wu, and Li Hua Yu, Submitted to PRST-AB

REFERENCES

Available upon request