

CURRICULUM VITAE

Ki-Tae Lee

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PERSONAL INFORMATION:

- Birth data: - Marital status: married
- Citizenship: Korean

EDUCATION and CAREER:

- Ph. D. in Physics, Pohang University of Science and Technology, Korea, 1994. 3 – 2000. 2
 - Thesis title: *Study on the dynamics of fast capillary discharge produced carbon plasma*
 - Advisor: Dong-Eon Kim
- M. S. in Physics, Pohang University of Science and Technology, Korea, 1992. 3 – 1994. 2
 - Thesis title: *A numerical study of gas-puff Z-pinch dynamics using a 1D Lagrangian magnetohydrodynamic code.*
 - Advisor: Dong-Eon Kim
- B. S. in Physics Pohang University of Science and Technology, Korea, 1987. 3 – 1992. 3

CAREER:

- Adjunct Professor, Laser and Plasma Eng. University of Science and Technology, 2009. 9 – present
- Principal Researcher, Center for Quantum-Beam-based Radiation Research, Korea Atomic Energy Research Institute, Korea, 2011. 3 – present
- Senior Researcher, Korea Atomic Energy Research Institute, Korea, 2000. 12 – 2011. 2
- Research Associate, Pohang University of Science and Technology, Korea, 2000. 2 – 2000. 11

MEMBERSHIP of ACADEMIC SOCIETIES:

- The Korean Physical Society

- The Optical Society of Korea
- The Optical Society of America

AWARDS and HONORS:

- R&D prize of KAERI (KAERI), 2013
- Awarded Research fund for the advanced young scientist (Korea Science and Engineering Foundation), 1994.

RESEARCH EXPERIENCES

2011-Present: Center for Quantum-Beam-based Radiation Research, Korea Atomic Energy Research Institute, KOREA.

1. Generation of high energy proton and electron in relativistic plasmas
2. Atto-second x-ray pulse generation through Relativistic Nonlinear Thomson Scattering
3. High power Free electron laser development

2001-2012: LAB. for QUANTUM OPTICS, Korea Atomic Energy Research Institute, KOREA.

4. Generation of high energy proton in relativistic plasmas
5. Atto-second x-ray pulse generation through Relativistic Nonlinear Thomson Scattering
6. High power Free electron laser development
7. Atomic Spectroscopy
8. Laser Peening

1992-2000: LASER SCIENCE LAB. Pohang Univ. of Science and Technology, Pohang KOREA.

1. Numerical Simulations
 - A. One-Dimensional Magnetohydrodynamic simulation of Z-pinch plasma.
 - B. Ionization Balance of high density plasma.
 - C. Atomic kinetics of H-like ion in plasmas.
2. High power discharge experiment
 - A. Design and construction of 60kA, 20ns(rising time) pulse generator.
3. XUV Spectroscopy
 - B. Rowland type, 2m grazing incidence spectrometer with toroidal mirror and MCP detector.

- C. Flat-field XUV spectrometer with streak-camera for time-resolved spectroscopy (RIKEN, JAPAN, 1994).
- 4. UV/Visible Spectroscopy
 - D. 0.5m Czerny-Turner spectrometer with OMA system for time-gated experiment (gate-width of 10ns).

FILEDS of INTEREST

1. Relativistic plasma dynamics: generation of attosecond x-ray pulse, high energy particles
2. Interaction of ultrashort high intensity optical laser with matter (solid, gas, cluster)
3. Generation of ultrashort radiation
4. Spectroscopic diagnosis of plasmas

PUBLICATIONS (SCI journals)

1. Manoj Kumar, Kitae Lee, Seong Hee Park, Young Uk Jeong, and Nikolay Vinokurovm “Terahertz radiation generation by nonlinear mixing of two lasers in a plasma with density hill”, Phys, Plasmas **24**, 033104 (2017).
2. Kyung Nam Kim, Kitae Lee, Manoj Kumar, Ha-Na Kim, Seong Hee Park, Young Uk Jeong, Nikolay Vinokurov, and Yong Gi Kim, “*Quasi-monoenergetic proton beam from a proton-layer embedded metal foil irradiated by an intense laser pulse*”, Phys. Plasmas **23**, 033119 (2016).
3. Sungman Lee, Il Woo Choi, Ik-Bu Shon, Kitae Lee, Gyu Il Shim, Young Uk Jeong, Byung Heon Han, Woo Je Ryu, Ha-Na Kim, and Hyungki Cha, “*Femtosecond Laser-driven Intense Cu Ka X-ray Source with a novel film target driver*”, J. Korean Phys. Soc. **67**, 800 (2015).
4. Kyung Nam Kim, Kitae Lee, Seong Hee Park, Ji Young Lee, Young Uk Jeong, Nikolay Vinokurov, and Yong Gi Kim, “*Generation of a quasi-monoenergetic high energy proton beam from a vacuum-sandwiched double layer target irradiated by an ultraintense laser pulse*”, Phys. Plasma **21**, 043110 (2014).
5. Ha-Na Kim, Seong Hee Park, Kyung Nam Kim, Byungheon Han, Jae Sung Shin, Kitae Lee, Yong-Ho Cha, Kyu-Ha Jang, Min Yong Jeon, Sergei V. Miginsky, Young Uk Jeong, and Nikolay A. Vinokurov, “*The Real-Time Temporal and Spatial Diagnostics of Ultrashort High-Power Laser Pulses using an All-Reflective Single-Shot Autocorrelator*”, J. Opt. Soc. Korea **18**, 382 (2014).
6. Jungho Mun, Young Uk Jeong, Nikolay A. Vinokurov, Kitae Lee, Kyu-Ha Jang, Seong Hee Park, Min Yong Jeon, and Sang-In Shin, “*Variable-period permanent-magnet helical undulator*”, Phys. Rev. ST-AB **17**, 080701 (2014).

7. Sungman Lee, Kitae Lee, and Hyungki Cha, “*Activation Analysis of Indium, KCl, and Melamine by Using a Laser-induced Neutron Source*”, J. Korean Phys. Soc. **64**, 982 (2014).
8. S. Y. Chung, S. W. Hwang, K. Lee, D. Kim, and H. J. Lee, “*Generation of coherent attosecond pulsed from a nano-tube array illuminated by a high-power femtosecond laser*”, New J. Phys. **15**, 123017 (2013).
9. Hee Jin Kim, Changwan Lim, and Kitae Lee, “*Numerical Investigation of the Radiation from an Argon Plasma Generated by Using a High Explosive*”, J. Korean Phys. Soc. **62**, 1616 (2013).
10. Sungman Lee, Sangsoon Park, Kitae Lee, and Hyungki Cha, “*A laser-induced repetitive fast neutron source applied for gold activation analysis*”, Rev. Sci. Inst. **83**, 123504 (2012).
11. Sang-Young Chung, Hae June Lee, Kitae Lee, and Dong Eon Kim, “*Generation of a few femtosecond keV x-ray pulse via interaction of a tightly focused laser copropagating with a relativistic electron bunch*”, Phys. Rev. ST **14**, 060705 (2011).
12. K. Lee, J. Y. Lee, S. H. Park, Y.-H. Cha, Y. W. Lee, K. N. Kim, and Y. U. Jeong, “*Dominant front-side acceleration of energetic proton beams from plastic targets irradiated by an ultraintense laser pulse*”, Phys. Plasmas **18**, 013101 (2011).
13. K. Lee, S. Y. Chung, S. H. Park, Y. U. Jeong, and D. Kim, “*Effects of high-order fields of a tightly focused laser pulse on relativistic nonlinear Thomson scattered radiation by a relativistic electron*”, Europhys. Lett. **89**, 64006 (2010).
14. Y. U. Jeong, K. Lee, Y.-H. Cha, S. H. Park, B. C. Lee, S. Lee, S. Kwon, D.-H. Kwon, S. Nam, Y. J. Rhee, H. Cha, Y.-W. Lee, K.-H. Yea, J. Mun, and J. Y. Lee, “*Generation of High-energy Particles and Radiation from a Relativistic Plasma for Nuclear Research*”, J. Korean Phys. Soc. **56**, 251 (2010).
15. K. Lee, S. H. Park, and Y. U. Jeong, “*Spectral Characteristics of Nonlinear Compton Backscattering of an Ultra-intense Laser pulse by Relativistic electrons*”, J. Korean. Phys. Soc. **56**, 265 (2010).
16. D. Kim, H. Lee, S. Chung, and K. Lee, “*Attosecond keV x-ray pulses driven by Thomson scattering in a tight focus regime*”, New. J. Phys. **11**, 063050 (2009).
17. K. Lee, J. Y. Lee, Y.-H. Cha, Y. W. Lee, S. H. Park, and Y. U. Jeong, “*Different effects of a laser prepulse on the proton generation between plastic and metal targets irradiated by an ultraintense laser pulse*”, Phys. Plasmas **16**, 013106 (2009).
18. K. Lee, S. H. Park, Y.-H. Cha, J. Y. Lee, Y. W. Lee, K.-H. Yea, and Y. U. Jeong, “*Generation of intense proton beams from plastic targets irradiated by an ultraintense laser pulse*”, Phys. Rev. E **78**, 056403 (2008).

19. H Lee, S Chung, K Lee, and D Kim, “A study of the Thomson scattering of radiation by a relativistic electron of a tightly-focused, co-propagating femtosecond laser beam”, New J. Phys. **10**, 093024 (2008).
20. Y. W. Lee, Y. H. Cha, J. H. Yi, S. M. Nam, K. Lee, Y. J. Rhee, Y. U. Jeong, and H. K. Cha, “Silver-mirror-based multipass preamplifier for a broadband terawatt Ti:sapphire laser”, Appl. Opt. **47**, 1015 (2008).
21. Changhwan Lim, Sung-Ki Hong, Kwanghoon Ko, Jeong-Tae Jin, Minsuk Kim, Dong-Hyun Yun, Lung-Je Li, Dong-Won Lee, Ki-Tae Lee, and Cheol-Jung Kim, “Construction of the 1 kJ Nd:Glass laser facility at KAERI”, J. Phys.: Conf. Ser. **112**, 032012 (2008).
22. Jungho Mun, Kwon-hae Yea, Young Uk Jeong, Yong Woo Lee, Pil Dong Ahn, Kitae Lee, Yong Ho Cha, Hyuk Jin Cha, Seong Hee Park and Byung Cheol Lee, “Observation of Intense Terahertz Radiation from a Laser-Produced Relativistic Plasma Generated on Metal and Plastic Solid Targets”, J. Korean Phys. Soc. **51**, 421 (2007).
23. Ji Young Lee, Jae Heung Jo, Seong Hee Park, Kitae Lee, Yong Woo Lee, Kwon-Hae Yea, Yong Ho Cha, and Young Uk Jeong, “Study on the Tracks in a Nuclear Track Detector (CR39) for Detection of Laser-Induced Charged Particles”, J. Korean Phys. Soc. **51**, 426 (2007).
24. Seong Hee Park, , Ji Young Lee, Kitae Lee, Young Uk Jeong, Byung Cheol Lee, Sergei Miginsky, and A.V. Bondarenko, “Design study of the KAERI Compton X-ray source depending on the laser intensity in the linear or non-linear regime”, Nuclear Inst. Meth in Phys. Res. A **575**, 17 (2007).
25. Sungman Lee, Sungok Kwon, Kitae Lee, Yong-Ho Cha, Duck-Hee Kwon, Sungmo Nam, Kwon-Hae Yea, Yong Woo Lee, Young Uk Jeong, Yong Joo Rhee and Hyungki Cha, “Effect of the Prepulse Width on the Neutron Generation in a Femtosecond, Deuterated, Polystyrene Plasma”, J. Korean Phys. Soc. **51**, 1695 (2007).
26. Kitae Lee, C. H. Lim, and S. O. Kwon, “Propagation of a Laser-Generated Shock Wave in a Metal Confined in Water”, J. Korean Phys. Soc. **49**, 387 (2006).
27. Seong Hee Park, Young Uk Jeong, Kitae Lee, Dong Hyun Kim, Yong-Ho Cha, Byeong Duk Yoo, Ilwoo Choi, Tae-Jun Yu, Yeung-Lak Lee, Kyung-Han Hong, Do-Kyeong Ko, and Jongmin Lee, “Faraday Cup Measurements of a Laser-Induced Plasma for a Laser-Proton Acceleration”, J. Korean Phys. Soc. **49**, 342 (2006).
28. Duck-Hee Kwon, Kitae Lee, Seong Hee Park, and Young Uk Jeong, “The Effect of the Transparency of an Overdense Plasma on Proton Beam Generation by an Intense Ultra-Short Laser Pulse”, J. Korean Phys. Soc. **49**, 546 (2006).
29. Kitae Lee, Seong Hee Park, and Young Uk Jeong, “Nonlinear Thomson Scattering for Attosecond X-ray Pulse Generation”, J. Korean Phys. Soc. **48**, 546 (2006).

30. K. Moribayashi, K. Lee, T. Kagawa, and D. E. Kim, “*X-ray emission from multi-inner-shell excited states produced by high-intensity short-pulse x-rays*”, Laser Phys. **16**, 322 (2006)
31. K. Lee, B. H. Kim, and D. Kim, “*Coherent radiation of relativistic nonlinear Thomson Scattering*”, Phys. Plasmas **12**, 043107 (2005).
32. K. Lee, Y. H. Cha, M. S. Shin, B. H. Kim, and D. Kim, “*Relativistic nonlinear Thomson scattering as attosecond x-ray source*”, Phys. Rev. E **60**, 26502 (2003).
33. K. Lee, Y. H. Cha, M. S. Shin, B. H. Kim, and D. Kim, “*Temporal and Spatial characterization of harmonics structures of relativistic nonlinear Thomson scattering*”, Optics Express **11**, 309 (2003).
34. Yong Ho Cha., Kitae Lee, Seong Mo Nam, Byoungduk Yoo, and Yong Joo Rhee, “*Optical Parametric Chirped-pulse Amplification of Femtosecond Ti:sapphire Laser Pulses by Using a BBO Crystal*”, J. Opt. Soc. Korea **7**, 139 (2003).
35. Yong Ho Cha, Ki Tae Lee, Jae Min Han, Byoungduk Yoo, Yong Joo Rhee and Cheoljung Kim, “*Effect of broadband single-stack mirrors in a 10-fs prism-controlled Ti:sapphire laser*”, J. Korean Phys. Soc. **42**, 775 (2003).
36. Yong Ho Cha, Kitae Lee, Jae Min Han, and Yong Joo Rhee, “*Sequence effect of optical elements in a femtosecon Ti:sapphire laser oscillator*”, J. Opt. Soc. Am. B **20**, 1369 (2003).
37. Hyunmin Park, Kostitsa, Duckhee Kwon, Yongho Cha, Kitae Lee, Sungmo Nam, Jaemin Han, Yongjoo Rhee, and Cheol-jung Kim, “*Effect of Laser intensity on the Selective Photoionization of the 168Yb Isotope*”, J. Korean Phys. Soc. **41**, 322 (2002).
38. Ki-Tae Lee, Dong-Eon Kim, and Seong-Ho Kim, “*Shock Model for the Reversed Current Flow in a Z-pinch Plasma*”, J. Korean Phys. Soc. **40**, 214 (2002).
39. Yong Ho Cha, Ki Tae Lee, Hyun Min Park, Jae Min Han, Yong Joo Rhee, “*Pulse Broadening by Discrete Distribution of Self-Phase Modulation and Dispersion in a Femtosecond Ti:Sapphire Laser*”, J. Korean Phys. Soc. **40**, 250 (2002).
40. Hyunmin Park, Kostitsa, Duckhee Kwon, Yongho Cha, Kitae Lee, Sungmo Nam, Jaemin Han, Yongjoo Rhee, Cheol-Jung Kim, “*Effect of Laser intensity on the Selective Photoionization of the 168Yb Isotope*”, J. Korean Phys. Soc. **41**, 322 (2002).
41. K. Lee and D. Kim, “*Another regime of operation for a 18.2 nm recombination laser using a capillary-discharged carbon plasma*”, Appl. Phys. Lett. **79**(13), 1968(2001).
42. Ki-Tae Lee, Seong Ho Kim and Dong-Eon Kim, “*Reversed current structure in a Z-pinch plasma*”, Phys. Rev. Lett. **85** (18), 3834(2000).
43. Kitae Lee and Dong-Eon Kim, “*Effects of excited states on the ionization balance in plasmas via the enhancement of ionization and recombination rate coefficients*”, Phys. Rev. E **60** (2), 2224(1999).

44. K. T. Lee and D. Kim, "*The Gain Characteristics of C VI 18.2nm Line in a Z-pinch Carbon Plasma*", J. Korean Phys. Soc. **32** (3), 304(1998).
45. Seong Ho Kim, Ki-Tae Lee, Dong-Eon Kim, and Tong Nyong Lee, "*Numerical study of the propagation of ionization processes in an oxygen Z-pinch plasma*", Phys. Plasmas **4** (3), 730-736(1997).
46. K. T. Lee, S. H. Kim, D. Kim, and T. N. Lee, "*Numerical study on the dynamics of Z-pinch carbon plasma*", Phys. Plasmas **3** (4), 1340-1347(1996).