Sung-Woo Lee, PhD

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EDUCATION

Ph. D., Electrical Engineering, University of Tennessee, Knoxville, TN, USA, May 2008. **(GPA: 3.58/4.0)**

Dissertation: Mutual Coupling Considerations in the Development of Multi-feed Antenna Systems

MS., Electrical Engineering, Arizona State University, Tempe, AZ, USA, August 2003. **(GPA: 3.56/4.0)**

Thesis: Design and Analysis of a Nonlinear Microwave Circuit using Extended FDTD Method

MS., Electronics Engineering, Kookmin University, Seoul, Korea, February 2000. **(GPA: 4.35/4.5)**

Thesis: A Study on the Design and Implementation of a Source Pumped FET Image Rejection Mixer

B.E., Electronics Engineering, Kookmin University, Seoul, Korea, February 1998. **(GPA: 3.61/4.5)**

Thesis: Design and Implementation of a Single Bias FET Source Mixer

RESEARCH EXPERIENCE

2008 May-current UT-Battelle Oak Ridge, TN, USA
Research & Development Staff as High-Power RF Engineer, Spallation Neutron Source, ORNL
- Research and performance enhancement on High-Power and Structure RF system for Linear Accelerators

Research & Development Staff as Low-Level RF Engineer, Spallation Neutron Source, ORNL
- Research and performance enhancement on Low-Level RF control system for Linear Accelerators

2003-2008 University of Tennessee Knoxville, TN, USA
Research Assistant in Electrical and Computer Engineering Department, Wingard Company, Intel Corp.
Research Assistant as Internship in RF Structure Group, Spallation Neutron Source, ORNL
- Research on the Physics Based Time Domain Analysis on High Power and High Frequency Devices.
- Research on the Reconfigurable Diversity Antennas on Laptop MIMO Applications. (Intel Corp.)
- Dual Feed-horn for DBS Reflector Antennas. (Wingard)
- Research on performance enhancement and measurement of RF structure for Linear Accelerators (SNS, ORNL)

2002-2003 Arizona State University Tempe, AZ, USA
Telecommunication Research Center (TRC), National Science Foundation (NSF)
- Research on the Optimization of Diode Extrinsic Structure using FDTD Method.

1999-2000 BSW Inc. Buchon, Korea
Engineering in R&D Lab.
- RF receiver module for B-WLL(24~27GHz) application
- Microwave Mixers for ITS(5.8GHz) application.

1998-2000 Moksung Electronic Co. Kimpo, Korea
Associate Research Program
- Development of RF Connectors.
- Development of RF Passive Components. (coaxial power splitters, broad band couplers and filters)

PUBLICATIONS (AS THE MAIN AUTHOR)

RF and Thermo-Mechanical Considerations in Designing the Waveguide Iris Coupler for the Drift Tube Linac in the ORNL Spallation Neutron Source
Sung-Woo Lee and Yoon W. Kang
- IPAC18 International Particle Accelerator Conference, Vancouver, BC, Canada May 2018.

Consideration on Determination of Coupling Factors of Waveguide Iris Couplers
Sung-Woo Lee, Yoon W. Kang, Mark Champion
- NA-PAC16 North American Particle Accelerator Conference, Chicago, Illinois, USA, Oct. 2016.

Study of Pre-tuning and High Power Test of DTL iris Waveguide Couplers using A Single Cell Cavity
Sung-Woo Lee, Yoon W. Kang, Mark Champion
- IPAC16 International Particle Accelerator Conference, Busan, Korea, May 2016.

RF Distribution System for High Power Test of the SNS Cryomodule
- IPAC12 International Particle Accelerator Conference, New Orleans, Louisiana, USA, May 2012.

Computer Simulations of Waveguide Window and Coupler Iris for Precision Matching
- PAC11 Particle Accelerator Conference, New York, New York, USA, March 2011.

Spallation Neutron Source High-Power Protection Module Test Stand
- LINAC10 Linear Accelerator Conference, Tsukuba, Japan, September 2010.

Computer Simulations for RF Design of a Spallation Neutron Source External Antenna H⁻ Ion Source
• Review of Scientific Instruments, vol. 81, February 2010.

Investigation of the Effects of Antenna Spacing and Orientation in MIMO System for Wireless Laptop Reception
• URSI National Radio Science Meeting, Boulder, Colorado, USA, January 2008.

Evaluation of Optimum Position and Orientation of Laptop MIMO antennas using Envelope Correlation Coefficients and Mutual Coupling Parameters
• IEEE AP-S International Symposium, Honolulu, Hawaii, USA, June 2007.

Design and Development of an Integrated Twin Feed Horn for a DBS Reflector Antenna
• IEEE Transactions on Antennas and Propagation, vol. 54, No. 8, Aug. 2006.

Development of a Twin-Feedhorn for Dual Linear DBS Reflector Antennas
• IEEE MTT-S International Microwave Symposium, Long Beach, CA, USA, June 2005.

Design and Implementation of a Single Bias FET Source Mixer
• Samsung Human Tech Thesis Prize (Mar. 1998)
• URSI International Symposium on Signals, Systems, and Electronics (Conference presentation Pisa, Italy Oct. 1998)

PUBLICATIONS (AS A CO-AUTHOR)

Sns Warm Linac Circulator Breakdown Considerations for the PPU Project
G. Toby, S. Lee, Y. Kang, S. Kim, J. Moss
• IPAC21 International Particle Accelerator Conference, Campinas, SP, Brazil May 2021.

Multipacting Analysis of Warm Linac RF Vacuum Windows
G. Toby, S. Lee, Y. Kang, S. Kim, J. Moss
• IPAC21 International Particle Accelerator Conference, Campinas, SP, Brazil May 2021.

Design and Performance of a Superconducting Neutron Resonance Spin Flipper
Ryan Dadisman, David Wasilko, Helmut Kaiser, Stephen J. Kuhn, Zachary Buck, Joseph Schaeperkoetter, Lowell Crow, Richard Riedel, Lee Robertson, Chenyang Jiang, Tianhao Wang, Nicolas Silva, Yoon Kang, Sung-Woo Lee, Kunlun Hong, and Fankang Li,
• Rev. Sci. Instrum.91, 015117 (2020); doi: 10.1063/1.5124681

Construction, Test, and Operation of a new RFQ at the Spallation Neutron Source (SNS)
Y. W. Kang, A. V. Aleksandrov, W. E. Barnett, M. S. Champion, M. Crofford, B. Han, S.-W. Lee, J. Moss, C. Peters, J. Price, T. Roseberry, J. P. Schubert, A. P. Shishlo, M. P. Stockli, C. Stone, R. F. Welton, D. Williams, A. P. Zhukov
• IPAC18 International Particle Accelerator Conference, Vancouver, BC, Canada May 2018.

In-situ plasma processing to increase the accelerating gradientsof superconducting radio-frequency cavities
M. Doleansn, P.V. Tyagi, R. Afanador, C.J. McMahan, J.A. Ball, D.L. Barnhart, W. Blokland,M.T. Crofford, B.D. Degraff, S.W. Gold, B.S. Hannah, M.P. Howell, S-H. Kim, S-W. Lee, J. Mammosser, T.S. Neustadt, J.W. Saunders, S. Stewart, W.H. Strong, D.J. Vandygriff,D.M. Vandygriff
• Nuclear Instruments and Methods in Physics Research A 812 (2016) 50–59

Modeling and Simulation of RFQs for Analysis of Fields and Frequency Deviations with respect to Internal Dimensional Errors
Y. W. Kang, S. W. Lee
• NA-PAC16 North American Particle Accelerator Conference, Chicago, Illinois, USA, Oct. 2016.

Neutron intensity modulation and time-focusing with integrated Larmor and resonant frequency techniques
Jinkui Zhao, William A. Hamilton, Sung-Woo Lee, J. L. Robertson, Lowell Crow, and Yoon W. Kang
• APPLIED PHYSICS LETTERS 107, 113508 (2015).

High Power RF Distribution and Control for Multi-Cavity Cryomodule Testing
Y.W.Kang, M.Broyles, M.Crofford, X.Geng, S.-H.Kim, S.-W.Lee, C.Phibbs, K.Shin, and H.Strong
• PAC11 Particle Accelerator Conference, New York, New York, USA, March 2011.

Status of the Oak Ridge Spallation Neutron Source (SNS) RF Systems
T.Hardek, M.Crofford, Y.Kang, S.-W.Lee, M.Middendorf, M.piller, and A.Vassioutchenko
• PAC11 Particle Accelerator Conference, New York, New York, USA, March 2011.

Developments for Performance Improvement of SNS H-Ion Source RF Systems
Y.W.Kang, R.Fuja, T.Hardek, S.W.Lee, M.P.McCarthy, M.C.Piller, K.Shin, M.P.Stockli and A.Vassioutchenko
• LINAC10 Linear Accelerator Conference, Tsukuba, Japan, September 2010.

Spallation Neutron Source LLRF Temperature Dependence and Solution
M.T.Crofford, J.A.Ball, T.L.Davidson, T.Hardek, S.W.Lee, and M.C.Piller
• LINAC10 Linear Accelerator Conference, Tsukuba, Japan, September 2010.

The continued development of the Spallation Neutron Source external antenna H-Ion Source
R. F. Welton, J. Carmichael, N. J. Desai, R. Fuga, R. H. Goulding, B. Han, Y. Kang, S. W. Lee, S. N. Murray, T. Pennisi, K. G. Potter, M. Santana, and M. P. Stockli
• Review of Scientific Instruments, vol. 81, February 2010.

RF improvements for Spallation Neutron Source H− ion source
Y. W. Kang, R. Fuja, R. H. Goulding, T. Hardek, S.-W. Lee, M. P. McCarthy, M. C. Piller, K. Shin, M. P. Stockli, and R. F. Welton

• Review of Scientific Instruments, vol. 81, February 2010.

Building Twisted Waveguide Accelerating Structures
M.H.Awida, Y.W.Kang, S.-H.Kim, S.W.Lee, and J.L.Wilson
• PAC09 Particle Accelerator Conference, Vancouver, Canada, May 2009.

A Low Profile Twin-PIFA Laptop Reconfigurable Multi-band Antenna for Switchable and Fixed Services Wireless Applications
Chunna Zhang, Songnan Yang, Sungwoo Lee, Samir El-Ghazaly, Aly E. Fathy, Helen K. Pan and Vijay K. Nair
• IEEE MTT-S International Microwave Symposium, Honolulu, HI, USA, June 2007.

Recent Progress in Reconfigurable Multi-band Antennas for Switchable and Fixed-Service Laptop Wireless Applications
Chunna Zhang, Songnan Yang, Sungwoo Lee, Helen K. Pan , Vijay K. Nair, Aly E. Fathy, and Samir El-Ghazaly
• National Radio Science Conference (NRSC), March 2007.

A Simplified Design Approach for Radial Power Combiners
A.E. Fathy, Sung-Woo Lee, and D.Kalokitis
• IEEE Transactions on Microwave Theory and Techniques, vol. 54, No. 1, Jan. 2006.

Patch Antennas: an Alternative Feed to Reflectors
Songnan Yang, Sungwoo Lee and Aly E. Fathy
• IEEE AP-S International Symposium, July 2005.

HONORS AND AWARDS

• Sep., 2003~May, 2008	Research Assistantship at University of Tennessee (Intel, ORNL)
• May, 2002~Aug., 2003	Research Assistantship at Arizona State University (NSF)
• Sep., 1998~Dec., 1998	Teaching Assistantship at Kookmin University
• Mar., 1998~Feb., 2000	Academic scholarship by Samsung Elec. Co. (Total amount of $3,200)
• Mar., 1998	Bronze Medal of Human Tech Thesis Prize by Samsung Elec. Co. ($1,800)
• Sep., 1995~Aug., 1997	Academic scholarship by Kookmin University (Total amount of $2,000)

SKILLS

- ***CAD Tools*** **:**
  CST Microwave Studio, Ansys, Solidworks, etc.
- ***Languages*** **:**
  C, C++, Matlab, LabVIEW, Python, etc.
- ***Equipment*** **:**
  Keysight Vector Network Analyzers (VNAs), Digital Oscilloscopes, etc.