

Youho Lee

Assistant Professor

Department of Nuclear Engineering

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Active Areas of Research

- Mechanics-thermal hydraulics coupled analysis for nuclear safety
- Thermomechanical analysis for materials in extreme environments
- Accident tolerant nuclear fuel development
- Nuclear reactor thermal hydraulics
- Spent nuclear fuel behavior for interim storage

Professional Position

- | | |
|------------------|--|
| 2016.9 – present | University of New Mexico (UNM),
Assistant professor |
| 2013 – 2016.8 | Korea Advanced Institute of Science and Technology (KAIST),
Postdoctoral researcher,
Alternative service for military service obligation (3 years)
Date of discharge: 2016.8.27 |

Education

- | | |
|-------------|--|
| 2011 - 2013 | Massachusetts Institute of Technology (MIT),
Nuclear Engineering, Ph.D,
Advisor: Mujid S. Kazimi
Thesis Title: Safety of Nuclear Fuel with Silicon Carbide Cladding |
| 2009 - 2011 | Massachusetts Institute of Technology (MIT),
Engineering, M.S,
Advisor: Charles W. Forsberg
Thesis Title: Conceptual Design of Nuclear-Geothermal Energy Storage Systems
for Variable Electricity Production |
| 2005 - 2009 | Korea Advanced Institute of Science and Technology (KAIST),
Nuclear and Quantum Engineering, B.S |

Publications

Journal papers

Published/Article in press

2017. **Youho Lee**, Jeong Ik Lee, Hee Cheon NO. Mechanical Analysis of Surface-Coated Zircaloy Cladding. *Nuclear Engineering and Technology*. (Accepted, in press)

2017. **Youho Lee**, Hee Cheon NO, Jeong Ik Lee. Design Optimization of Multi-Layer Silicon Carbide Cladding for Light Water Reactors. *Nuclear Engineering and Design*, 311, 213-223

2016. **Youho Lee**, Bokyoung Kim, Hee Cheon NO. Improving Safety Margin of LWRs by Rethinking the Emergency Core Cooling System Criteria and Safety System Capacity. *Nuclear Engineering and Design*, 307, 402-410

2016. Seong Gu Kim, **Youho Lee**, Yoonhan Ahn, Jeong Ik Lee. CFD aided approach to heat exchangers for supercritical CO₂ Brayton cycle application. *Annals of Nuclear Energy*. 92, 175-185.

2016. **Youho Lee**, Jeong Ik Lee, Hee Cheon NO. Impacts of Transient Heat Transfer Modelling on Prediction of Advanced Cladding Fracture during LWR LBLOCA. *Nuclear Engineering and Design*, 298, 25-32.

2016. **Youho Lee**, Thomas J. McKrell, Mujid S. Kazimi. Oxidation Behavior of Sintered Tubular Silicon Carbide in Pure Steam II: Weight-Loss Correlation Developments. *Ceramics International*, 42, 4679-4689.

2016. **Youho Lee**, Thomas J. McKrell, Aline Montecot, Michael Pantano, Yann Song, Mujid S. Kazimi. Oxidation Behavior of Sintered Tubular Silicon Carbide in Pure Steam I: Experiments. *Ceramics International*, 42, issue 1, Part B, 1916-1925.

2015. **Youho Lee**, Thomas J. McKrell, Mujid S. Kazimi. Thermal Shock Fracture of Hot Silicon Carbide Immersed in Water. *Journal of Nuclear Materials*, 467, 172-180.

2015. **Youho Lee**, Ho Sik Kim, Hee Cheon NO. Failure probabilities of SiC Clad Fuel during a LOCA in Public Acceptable Simple SMR (PASS). *Nuclear Engineering and Design*, 292, 1-16.

2015. Seongmin Son, **Youho Lee**, Jeong Ik, Lee. Development of an Advanced Printed Circuit Heat Exchanger Analysis Code for Realistic Flow Path Configurations near Header Regions. *International Journal of Heat and Mass Transfer*, 89, 242-250.

2015. **Youho Lee**, Mujid S. Kazimi. A Structural Model for Multi-Layered Ceramic Cylinders and its Application to Silicon Carbide Cladding of Light Water Reactor Fuel. *Journal of Nuclear Materials*, 458, 87-105.

2014. **Youho Lee**, Jeong Ik Lee. Structural Assessment of Intermediate Printed Circuit Heat Exchanger for Sodium-Cooled Fast Reactor with Supercritical CO₂ Cycle. *Annals of Nuclear Energy*, 73, 84-95.

2013. **Youho Lee**, Thomas J. McKrell, Mujid S. Kazimi. Thermal Shock Fracture of Silicon Carbide and Its Application to LWR Fuel Cladding Performance during Reflood. *Nuclear Engineering and Technology (Invited Article from the ICAPP2013 Proceeding)*, 45 (6), 811-820.

2013. **Youho Lee**, Thomas J. McKrell, Chao Yue, Mujid S. Kazimi. Safety Assessment of SiC Cladding Oxidation Under Loss of Coolant Accident (LOCA) Conditions in LWRs. *Nuclear Technology*, 183 (2), 210-227.

2010. **You Ho Lee**, Jeong Ik Lee, Hee Cheon NO. A Point Model for the Design of a Sulfur Trioxide Decomposer for the SI Cycle and Comparison with a CFD Model. *International Journal of Hydrogen Energy*, 35, 5210-5219.

Conference papers/ Posters/Reports

2016. **Youho Lee**, Bokyung Kim, Hee Cheon NO Rethinking of Zircaloy Embrittlement Criteria for Improving Safety Margin of Light Water Reactor. ANS'16 Winter Meeting. November 6-10, 2016 Caesars Palace Las Vegas, NV

2016. **Youho Lee**, Bokyung Kim, Hee Cheon NO. Rethinking the Zircaloy Embrittlement Criteria and Its Impact on the Safety Margin. *Transactions of the Korean Nuclear Society Spring Meeting*. Jeju , Korea, May 11-13.

2016. **Youho Lee**. Mechanical behavior of SiC clad LWR fuels for steady-states and LOCA. ICAPP. San Francisco, Kazimi's Special Session I, USA, April 17-20.

2015. **Youho Lee**, Seong min Son, and Jeong Ik Lee. A double-wall LWR cladding concept with multi-cylinder misfitting. TOPFUEL. Zurich, Switzerland, September 13-17.

2015. **Youho Lee**, and Hee Cheon NO. Heat Transfer Origin of Thermal Shock fracture and its Application to LWR Fuel during Reflood. NURETH-16. Chicago, U.S.A, August 30- September 4.

2015. **Youho Lee**, Hee Cheon NO, and Jeong Ik Lee. Design Optimization of Multi-Layer Silicon Carbide Cladding for Light Water Reactors. *Transactions of the Korean Nuclear Society Spring Meeting*. Jeju, Korea, May 7-8.

2015. **Youho Lee**, Jeong Ik Lee, and Hee Cheon NO. Effects of Heat Transfer Coefficient Treatments on Thermal Shock Fracture Prediction for LWR Fuel Claddings in Water Quenching. *Transactions of the Korean Nuclear Society Spring Meeting*. Jeju, Korea, May 7-8.

2015. Faris B. Sweidan, **Youho Lee**, and Ho Jin Ryu. The Effect of Protective Coating on the LOCA Simulation of Zircaloy-4 Cladding. *Transactions of the Korean Nuclear Society Spring Meeting*. Jeju, Korea, May 7-8.

2014. Min-Gil Kim, **Youho Lee**, and Jeong Ik Lee. Flow Regime Comparison of MARS-KS to SPACE during LBLOCA. *Transactions of the Korean Nuclear Society Autumn Meeting*. Pyeongchang, Korea, October 30-31.

2014. H.J. Kim, S.J. Wang, S.W. Seon, **Y. Lee**, B.H. Park, S.W. Yoon. Thermal Analysis on the KSTAR ICRF Vacuum Feedthrough using ANSYS. *Transactions of the Korean Nuclear Society Autumn Meeting*. Pyeongchang, Korea, October 30-31.
2014. Min-Gil Kim, **Youho Lee**, and Jeong Ik Lee. Preliminary Comparisons of Thermal Hydraulic Characteristics of Core Using from 10 by 10 Fuel Assembly to 20 by 20 Fuel Assembly for SMART. *Transactions of the Korean Nuclear Society Autumn Meeting*. Pyeongchang, Korea, October 30-31.
2014. **Youho Lee**, Hee Cheon No, and Jeong Ik Lee. Structural Analysis of Surface-Modified Oxidation-Resistant Zirconium Alloy Cladding for Light Water Reactors. *Transactions of the Korean Nuclear Society Spring Meeting*. Jeju, Korea, May 29-30.
2014. Min-Gil Kim, **Youho Lee**, and Jeong Ik Lee. Preliminary Comparisons of Thermal Hydraulic Characteristics of Core Using from 10 by 10 Fuel Assembly to 20 by 20 Fuel Assembly for SMART. *Transactions of the Korean Nuclear Society Spring Meeting*. Jeju, Korea, May 29-30.
2014. **Youho Lee**, Ho Sik Kim, and Hee Cheon NO. Safety of Silicon Carbide Cladding for Fail-Safe Simple Economical SMR (FASES). *Summary of ANS'14, Embedded Topical Meeting on Nuclear Fuels & Structural Materials for Next Generation Nuclear Reactors*. 9887. Reno, NV, USA, June 15-19.
2014. **Youho Lee**, Thomas J. McKrell, and Mujid S. Kazimi. Key Structural Challenges of SiC as Fuel Cladding for LWRs. *Proceedings of ICAPP'14*. 14358. Charlotte, NC, USA, April 6-9.
2014. **Youho Lee**, and Jeong Ik Lee. Structural Assessment of Intermediate Printed Circuit Heat Exchanger for Supercritical CO₂ Cycle attached to Sodium Fast Reactor. *Proceedings of ICAPP'14*. 14340. Charlotte, NC, USA, April 6-9.
2014. Min-Gil Kim, **Youho Lee**, and Jeong Ik Lee. Comparison of Thermal Hydraulic Performance of Rod-Type Fuel for Small Modular Reactor Application. *Proceedings of ICAPP'14*. 14067. Charlotte, NC, USA, April 6-9.
2013. **Youho Lee**, Thomas J. McKrell, and Mujid S. Kazimi. Thermal Shock Fracture of Silicon Carbide and Its Application to LWR Fuel Cladding Performance During Reflood. *Proceedings of ICAPP'13*. 101.13. Jeju Island, Korea, April 14-18.
2012. **Youho Lee**, Chao Yue, Ramsey P. Arnold, Thomas J. McKrell, and Mujid S. Kazimi. Oxidation of SiC Cladding Under Loss of Coolant Accident (LOCA) Conditions in LWRs. *Proceedings of ICAPP'12*. 12265. Chicago, USA, June 24-28.
2012. C. W. Forsberg, **Y. Lee**, M. Kulhanek, and M. J Driscoll. Gigawatt-Year Nuclear Geothermal Energy Storage for Light-Water and High-Temperature Reactors. *Proceedings of ICAPP'12*. 12446. Chicago, USA, June 24-28.
2012. Koroush Shirvan, Yu-ChihKo, **Youho Lee**, Sheng Xu, YaninSukjai, and Mujid S. Kazimi. Advanced Compact Nuclear Reactors. *MIT Energy Show Case '12*. Poster. Boston, USA, March 16.

2011. **Youho Lee**, Charles W. Forsberg, and M. J Driscoll. Conceptual Design of Nuclear-Geothermal Energy Storage Systems for Variable Electricity Production. *Summary of ANS'11 Winter Meeting*. 4548. Washington, D.C., USA, October 30- November 3.
2011. Charles W. Forsberg, Rebecca Krentz-Wee, **You Ho Lee**, and Isaiah O. Oloyede. Nuclear Energy for Low-Carbon Heavy-Oil Recovery and Gigawatt-Year Heat Storage for Peak Electricity Production. *MIT Center for Advanced Nuclear Energy Systems*. Report.MIT-NES-TR-011. Cambridge, USA.
2011. J Stempien, R. Arnold, **Y. Lee**, C. Yue, J. Dobesisky, D. Carpenter, G. Kohse, T. McKrell, E. Pilat, and M. Kazimi. Advanced Fuels for Enhanced Safety and Economics of Nuclear Energy. *MIT Energy Night'11*. Poster. Cambridge, USA, October 21.
2011. **Youho Lee**.et.al. Conceptual Design of Molten Salt Loop Experiment for MIT Research Reactor. *MIT Center for Advanced Nuclear Energy Systems*. Report.MIT-MRR-DES-00. Cambridge, USA.
2010. **Youho Lee**, Isaiah Oloyede, Charles W. Forsberg, and Michael J. Driscoll. Requirements for Seasonal Electricity Storage. *MIT Energy Night'10*. Poster. Cambridge, USA, October 22.
- 2010.**You Ho Lee**, Charles W. Forsberg, Michael J. Driscoll, and Benyamin Sapiie. Options for Nuclear Gigawatt-Year Peak Electricity Storage Systems. *Proceedings of ICAPP'10*. 10212. San Diego, USA, June 13-17.
2007. **You Ho Lee**, and Hee Cheon NO. Computational Analysis of a Direct Thermo-Chemical Sulfuric Acid Decomposer Used for Hydrogen Production. *Transactions of the Korean Nuclear Society Meeting' 07*.Jeju, Korea, May 10-11.

Honors and Awards

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|-------------|---|
| 2014 | Best Paper Award,
Division of Fuel and Materials, Korean Nuclear Society,
Paper title: Structural Analysis of Surface-Modified Oxidation-Resistant Zirconium Alloy Cladding for Light Water Reactors |
| 2013 | Department's Doctoral Research Expo Seminar Selectee,
Selected by faculty to give a signature talk on behalf of doctoral students in Department's fission program,
Department of Nuclear Science Engineering,
MIT, 8 March |
| 2009 | Manson Benedict Fellowship,
Department of Nuclear Science and Engineering, MIT |
| 2009 - 2011 | Korean Government Scholarship for Overseas Studies,
Korea Institute of Energy Technology Evaluation and Planning, |

2008	Best Paper Award (Minister Award of Ministry of Education, Science and Tech), National Nuclear Engineering Research Competition for Korean Undergraduates, Paper title: Thermal Hydraulic Analysis of the Heat Exchanger of a Hydrogen- Production Nuclear Reactor and Design Optimization,
Teaching	
2017	NE 314 Thermodynamics and Nuclear Systems Department of Nuclear Engineering, University of New Mexico Spring Semester
Invited Talks	
2016	Department of Nuclear Engineering University of New Mexico, United States, 29 March
2015	Applied Material Physics group, Karlsruhe Institute of Technology, Germany, 9 September
2015	Department of Engineering, University of Cambridge, United Kingdom, 7 September
2015	KEPCO Nuclear Fuel (KNF) Daejeon, South Korea, 1 July
2013	Nuclear Fuel & Materials Development Department, Korea Atomic Energy Research Institute (KAERI), Korea 14 November
2013	Department of Nuclear and Quantum Engineering, Korea Advanced Institute of Science and Technology (KAIST), Korea 24 April
2013	Department of Nuclear Engineering, Seoul National University, Korea 23 April
2013	Interdisciplinary School of Green Energy, Ulsan National Institute of Science and Technology (UNIST), Korea 22 April
2012	Presentation on SiC cladding safety assessment project, Visit of Dr. Peter B. Lyon, the Assistant Secretary for Nuclear Energy of DOE, MIT, 15 June
2012	MIT Symposium on Advanced LWR Fuels, MIT, 20 March
Leadership	
2012	Co-Chair of International Student Relations, 2013 American Nuclear Society (ANS) Student Conference

2012	Chair, Korean Student Association of MIT Nuclear Science and Engineering
2010	Team leader, Thermal Hydraulics Team, 22.33 Nuclear Systems Design Project, MIT, Project: Design of Molten Salt Loop Experiment for MIT Research Reactor
2008	Undergraduate Student Chair, Department of Nuclear Science and Engineering, KAIST

Association

American Nuclear Society, Korean Nuclear Society

Computer Skills

C/C++, FORTRAN, MATLAB, FLUENT, FRAPCON, FRAPTRAN, RELAP, MARS, ANSYS

Language Proficiency

Native Korean

Fluent in English