



Curriculum Vitae

Wonkyeong Kim

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AFFILIATION

Combined MSc and Ph.D Program (4th semester)

Computational Reactor Physics and Experiment Laboratory (CORE)

Ulsan National Institute of Science & Technology (UNIST)

UNIST-gil 50, Ulsan Metropolitan City, Republic of Korea, 689-798

EDUCATION

■ **Bachelor of Engineering**

- Major: Green Energy Engineering (UNIST, Ulsan, Korea, 2009.2~2015.8)

1st track: Nuclear Science & Engineering

2nd track: Energy Conversion & Storage

RESEARCH EXPERIENCE

■ **Comparative analysis on DIMPLE S06A&B benchmark, UIUC, IL, USA**

: Undergraduate Research Opportunity Program, Aug. 2014

- Comparative analysis on direct modeling and two-step modeling using contemporary reactor analysis codes (MCNP6, SERPENT2, CASMO-4E, T-NEWT, PARCS)

■ **Benchmark analysis of ADSR(Accelerator Driven Subcritical Reactor), UNIST & KURRI**

: Undergraduate Research Assistant, Sep. 2014 ~ Jun. 2015

- KUCA A-type core modeling using MCNP6.1

- C/E comparison of subcriticality

- C/E comparison of reaction rate distribution on indium wire detection

- C/E comparison on foil activation with dosimetry libraries (ENDF/VII.1, JENDL/D-99, IRDFFv1.05)

■ **IAEA CRP on HTGR, IAEA, Vienna, Austria**

: Research Aide, July. 2015 ~ Dec. 2015

- IAEA Coordinated Research Program on HTGR Uncertainty Analysis: Results of unit cell model using SCALE/TSUNAMI and the application of the RPT method

- IAEA Cooperative Research Project Phase I Standalone Neutronics: The contribution of cross-section uncertainties to Pebble Bed Reactor eigenvalues results

■ **EPFL CROCUS Reactor analysis for safety assessment, EPFL, Lausanne, Switzerland**

: Research Aide, Aug. 2017 ~ Oct. 2017

- Source-term analysis of EPFL CROCUS reactor using in-house code, MCS

- Uncertainty quantification associated with the isotopic inventory of the

CROCUS fuel using Stochastic Sampling method

■ **UNIST CORE, Ph.D. Candidate (Aug. 2016 ~ current)**

- Depletion capability of in-house Monte Carlo code, MCS
- LWR depletion analysis using Hybrid depletion method (MC + MOC)
- USL analysis for Spent fuel pool and storage cask criticality analysis based on NUREG/CR-6698, 6361 methodologies
- Data generation for Big-Data analysis using generic PWR simulator
- Modeling (VERA benchmark, Hoogenboom benchmark, BEAVRS benchmark, ICSBEP Selected cases)

RESEARCH INTERESTS

- Hybrid method with Monte Carlo and MOC
- Uncertainty and sensitivity analysis of full-scale reactor core

CERTIFICATES

• **Awards & Scholarship**

- Full tuition waiver for GPA 3.3 or above (Mar, 2009 ~ Aug, 2015)

• **Training**

- FJOH 2017 summer school, Karlsruhe, Germany (Aug, 2017)
- CMS International Users Group Meeting, Lausanne, Switzerland (Oct, 2017)
- FJOH 2016 summer school, Aix-en-Provence, France (Aug, 2016)
- Nuclear Reactor Design: Theory and Practice training, Korea Atomic Energy Research Institute (KAERI, July, 2016)
- 2016 Falcon Training and Fuel Reliability Workshop, Korea Atomic Energy Research Institute (KAERI, Mar, 2016)
- PWR simulator training course, Korea Atomic Energy Research Institute (KAERI, June, 2015)
- Workshop on Methodologies for Spent Nuclear Fuel Pool Simulations, Safety and Security, Virginia Tech Research Center (VTRC, June, 2015)
- PWR simulator training course, Korea Atomic Energy Research Institute (KAERI, June, 2015)
- McCARD Developers' Training, Seoul National University (SNU, Mar, 2015)
- SCALE user training course, Oak Ridge National Laboratory (ORNL, Feb, 2015)
- MCNP user training course, Han-yang University (HYU, July, 2014)

• **Membership**

- Korean Nuclear Society Student Member (September 2014)

SCI Journal

1. **Wonkyeong Kim**, Mathieu Hursin*, Deokjung Lee, "Source term analysis of EPFL CROCUS Reactor and Uncertainty Quantification associated with the Isotopic Inventory of the CROCUS Fuel", Draft done (Internal review).
2. Jinsu Park, **Wonkyeong Kim**, Mathieu Hursin*, Deokjung Lee, "Uncertainty Quantification of LWR-PROTEUS Phase II Experiments using SHARK-X", Draft done (Internal review), Draft done (Internal review).
3. Jiwon Choe, Sooyoung Choi, Peng Zhang, Jinsu Park, **Wonkyeong Kim**, Ho Cheol Shin, Hwan Soo Lee, Ji-Eun Jung, Deokjung Lee*, "Verification and Validation of STREAM/RAST-K for PWR Analysis," Nucl. Eng. Tech., Under review (2018)
4. Mi Jin Kim, **Wonkyeong Kim**, Deokjung Lee, Matthieu Lemaire, Hee-Jae Lee,

- Dong-Seong Sohn*, Hyukjoo Kwon, “Development of Integral Type Spent Fuel Pool Storage Rack with Gadolinium-containing Structure Materials,” *Annals of Nuclear Energy*, Under review (2018)
5. Jinsu Park, Azamat Khassenov, **Wonkyeong Kim**, Sooyoung Choi, Jiankai Yu, Deokjung Lee*, “Comparative Analysis of VERA Depletion Benchmark through Consistent Code-to-Code Comparison,” *Annals of Nuclear Energy*, Under review (2018)
 6. Matthieu Lemaire, Hyunsuk Lee, Bamidele Ebiwonjumi, Chidong Kong, **Wonkyeong Kim**, Yunki Jo, Jinsu Park, Deokjung Lee*, “Verification of Photon Transport Capability of UNIST Monte Carlo Code MCS”, *Comput. Phys. Commun.*, Accepted for Publication (2018)
 7. Chidong Kong, Jiwon Choe, Seongpil Yum, Jaerim Jang, Woonghee Lee, Hanjoo Kim, **Wonkyeong Kim**, Nguyen Hoang Nhat Khang, Nguyen Dong Cao Tung, Vutheam Dos, Deokjung Lee*, Ho Cheol Shin, Masao Yamanaka, and Cheol Ho Pyeon, “Application of Advanced Rossi-alpha Technique to Reactivity Measurements at Kyoto University Critical Assembly,” *Annals of Nuclear Energy*, Under review (2018)
 8. Jaerim Jang, **Wonkyeong Kim**, Sanggeol Jeong, Eun Jeong, Jinsu Park, Matthieu Lemaire, Hyunsuk Lee, Yongmin Jo, Peng Zhang, Deokjung Lee*, "Validation of UNIST Monte Carlo Code MCS for Criticality Safety Analysis of PWR Spent Fuel Pool and Storage Cask," *Annals of Nuclear Energy*, 114: 495-509. <https://doi.org/10.1016/j.anucene.2017.12.054> (2018)
 9. **Wonkyeong Kim**, Hyun Chul Lee, Cheol Ho Pyeon, Ho Cheol Shin, Deokjung Lee* “Monte Carlo Analysis of the Accelerator-driven System at Kyoto University Research Reactor Institute,” *Nucl. Eng. Tech.*, 48 (2): 304-317. <http://dx.doi.org/10.1016/j.net.2015.12.001> (2016)
 10. **Wonkyeong Kim**, Jinsu Park, Deokjung lee*, Hyun Chul Lee and Tomasz Kozlowski, “Comparative neutronics analysis of DIMPLE S06 criticality benchmark with contemporary reactor core analysis computer code systems,” *Sci. Technol. Nucl. Ins.*, 2015: 11, <http://dx.doi.org/10.1155/2015/180979> (2015)
1. Matthieu Lemaire, Hyunsuk Lee, Bamidele Ebiwonjumi, Chidong Kong, **Wonkyeong Kim**, Yunki Jo, Jinsu Park, Deokjung Lee*, “Development of photon-transport capability in UNIST Monte Carlo code MCS”, *PHYSOR2018*, Cancun, Mexico, April 22-26 (2018) [Oral Presentation]
 2. Hanjoo Kim, **Wonkyeong Kim**, Frederik Reitsma, Gerhard Strydom, Deokjung Lee*, “UNCERTAINTY QUANTIFICATION OF PEBBLE BED REACTOR FUELS USING SAMPLING METHOD: CONTRIBUTION OF MANUFACTURING PARAMETERS AND CROSS SECTION UNCERTAINTY”, *PHYSOR2018*, Cancun, Mexico, April 22-26 (2018) [Oral Presentation]
 3. Khang Nguyen, Jiwon Choe, Sooyoung Choi, Hyunsuk Lee, **Wonkyeong Kim**, Deokjung Lee*, MatthieuLemaire, “Verification of STREAM and MCS against OPR FA depletion calculation”, *RPHA17*, Chengdu, Sichuan, China, August 24-25 (2017) [Oral presentation]
 4. Matthieu Lemaire, Hyunsuk Lee, Bamidele Ebiwonjumi, Chidong Kong, **Wonkyeong Kim**, Yunki Jo, Jinsu Park, Deokjung Lee*, “Recent Work on Photon Transport with UNIST Monte Carlo Code MCS”, *RPHA17*, Chengdu, Sichuan, China, August 24-25 (2017) [Oral presentation]

International and Topical Meetings

5. Chidong Kong, Hyunsuk Lee, Matthieu Lemaire, **Wonkyeong Kim**, Yunki Jo, Jinsu Park, JiwonChoe, Bamidele Ebiwonjumi, Deokjung Lee*, “Introduction to UNIST Spent Nuclear Fuel Transportation Package Analysis Code System”, RPHA17, Chengdu, Sichuan, China, August 24-25 (2017) [Oral presentation]
6. Hyunsuk Lee, **Wonkyeong Kim**, Peng Zhang, Azamat Khassenov, Jinsu Park, Jiankai Yu, Sooyoung Choi, Hwan Soo Lee and Deokjung Lee*, “Preliminary Simulation Results of BEAVRS Three-dimensional Cycle 1 Wholecore Depletion by UNIST Monte Carlo Code MCS,” M&C2017, Jeju, Korea, April 16-20 (2017) [Oral Presentation]
7. **Wonkyeong Kim**, Hyunsuk Lee, Sooyoung Choi, Ji-Eun Jung, and Deokjung Lee*, “Hybrid Depletion Method for the Light Water Reactor analysis,” M&C 2017, Jeju, Korea, April 16-20, 2017
8. **Wonkyeong Kim**, Frederik Reitsma, and Deokjung Lee*, “IAEA Coordinated Research Program on HTGR Uncertainty Analysis: Results of Exercise I-1c and I-1d Model and the Application of RPT Method,” *PHYSOR2016*, Sun Valley, ID, USA, May 1-5, 2016
9. Frederik Reitsma and **Wonkyeong Kim**, “The Contribution of Cross-Section Uncertainties to Pebble bed reactor Eigenvalues Results: IAEA Cooperative Research Project Phase I Standalone Neutronics,” *PHYSOR2016*, Sun Valley, ID, USA, May 1-5, 2016
10. **Wonkyeong Kim**, Deokjung Lee, Cheolho Pyeon “IAEA ADS Benchmark Analysis of KUCA Experiments: Phase I,” *ICAPP 2015*, Nice, France, May 3 - 6, 2015
11. **Wonkyeong Kim**, Jinsu Park, Deokjung Lee, Tomasz Kozlowski “Comparative Neutronics Analysis of DIMPLE S06 benchmark,” *Advances in Nuclear Fuel Management V (ANFM 2015)*, Hilton Head Island, South Carolina, USA, March 29 - April 1, 2015
12. Sanggeol Jeong, **Wonkyeong Kim**, Deokjung Lee*, “Design of High Density Spent Fuel Storage Rack Applying Burnup Credit,” Transaction of KNS Spring Meeting, Jeju, Korea, May 16-18 (2018) [Poster presentation]
13. Sanggeol Jeong, Jaerim Jang, **Wonkyeong Kim**, Azamat Khassenov, Deokjung Lee*, “Evaluation of NUREG/CR-6361 and NUREG/CR-6698 Methodologies of PWR Spent Fuel Pool and Storage Cask”, KNS Spring Meeting, Jeju, Korea, May 17-19 (2017) [Poster Presentation]
14. Jinsu Park, **Wonkyeong Kim**, Sooyoung Choi, Hyunsuk Lee, and Deokjung Lee, “Comparative Analysis of VERA Depletion Problems,” KNS Fall Meeting, Gyeongju, Korea, October 26-28, 2016
15. **Wonkyeong Kim**, Frederik Reitsma, and Deokjung Lee*, “MHTGR-350MW Cross-section Uncertainty Analysis for Exercise I on UAM benchmark,” KNS Spring Meeting, Jeju, Korea, May 11-13, 2016
16. Jaerim Jang, Jinsu Park, **Wonkyeong Kim**, Sanggeol Jeong, Deokjung Lee*, Kyoon-ho Cha, “Validation of UNIST Monte Carlo Code MCS for Criticality

**International
Domestic
Conferences** **and**

Safety Analysis,” KNS Spring Meeting, Jeju, Korea, May 11-13, 2016

17. Hyunsuk Lee, **Wonkyeong Kim**, Peng Zhang, Azamat Khassenov, Yunki Jo, and Deokjung Lee*, “Development Status of Monte Carlo Code at UNIST,” KNS Spring Meeting, Jeju, Korea, May 11-13, 2016
18. **Wonkyeong Kim** and Deokjung Lee, Benchmark analysis for ADS KUCA experiment: Reactivity and Indium wire reaction rate, KNS Spring Meeting, Jeju, Korea, May 6-8, 2015
19. **Wonkyeong Kim**, Deokjung Lee, Tomasz Kozlowski “Comparative Study of DIMPLE benchmark with Two-step and Direct Modelling Approaches,” Transactions of the Korean Nuclear Society Autumn Meeting, Pyeongchang, Korea, October 30-31, 2014
1. Deokjung Lee, Wonkyeong Kim, Sooyoung Choi, Hyunsuk Lee, Hybrid Depletion Method for Light Water Reactor Analysis, 2017, 10-2017-0059904

PATENT