



Curriculum Vitae

Taewoo Tak

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AFFILIATION

Senior Researcher, 2016.12~
Korea Atomic Energy Research Institute (KAERI)
111, Daedeok-Daero 989Beon-Gil, Yuseong-Gu, Daejeon, Korea, 34057

EDUCATION

Combined Master's and Ph.D Program

- Major: Nuclear Engineering
- Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea, 2011.8~2017.2

Bachelor of Engineering

- Major: Mechanical & Control Engineering
- Handong Global University, Pohang, Korea, 2006.2~2011.8

WORK EXPERIENCE

- Design study of Ultra-long Cycle Fast Reactor Core
 - UCFR-1000 (1000MWe), UCFR-100 (100MWe)
 - Breed-and-burn strategy
 - Monte Carlo depletion
 - PWR spent fuel utilization
 - Power flattening using thorium blanket
 - Inherent safety, quasi-static reactivity balance
- Design study of Small Modular Fast Reactor
 - Concept development for SMR-SFR
 - Both deterministic and stochastic approach
 - Long cycle operation with minimum reactivity swing
 - Transportable module
 - Develop design requirement
 - Inherent safety, ATWS transient analysis
 - Assessment of control system
- I-NERI (International Nuclear Energy Research Initiative) project
 - International joint research in ANL (Argonne National Laboratory) June 2015 ~ August 2015
 - International joint research in ANL (Argonne National Laboratory) August 2016

RESEARCH INTERESTS

- Liquid Metal Reactor design
- Ultra-long Cycle Fast Reactor design
- PWR spent fuel treatment
- Small modular reactor design
- Design requirement for SMR-SFR
- Inherent safety strategy for SMR-SFR

CERTIFICATES

- Awards & Scholarship
 - Journal Contribution award, Bronze, Korean Nuclear Society (October, 2015)
 - Excellent paper award, Bronze, Malaysian Nuclear Society (August, 2015)
 - Excellent poster award, Korean Nuclear Society (May, 2015)
 - Journal Contribution award, Bronze, Korean Nuclear Society (October, 2014)
 - Excellent poster award, Korean Nuclear Society (October, 2013)
 - PHYSOR scholarship, Korean Nuclear Society (October, 2013)
 - Doosan Heavy I&C scholarship, Korean Nuclear Society (May, 2012)
- Training (International)
 - Advanced MCNP training using Visual MCNP Editor (Daejeon, November, 2015)
 - FJOH 2012, KIT & CEA (Aix-en Province, August, 2012)
 - Research reactor KUCA (Kyoto University Critical Assembly) Experiment, Kyoto University (Osaka, July, 2012)
- Training (Domestic)
 - Reactor core design training, Central Research Institute (CRI, June, 2015)
 - McCARD developer training course, Seoul National University (SNU, March, 2015)
 - Measurement uncertainty training, Korea Testing & Research Institute (KTR, December, 2014)
 - McCARD user training course, Seoul National University (SNU, August, 2014)
 - LWR refueling core design training, KHNP CRI (HYU, July, 2014)
 - Basic theory and programming practice of nuclear reactor design and analysis with Monte Carlo method (INTEC, January, 2014)
 - McCARD user training course, Seoul National University (SNU, August, 2013)
 - Practical shell programming for system administrator, Samsung SDS (Seoul, July, 2013)
 - Interfacing MATLAB with C Code, MathWorks training services (Seoul, April, 2013)
 - Whole core transport analysis seminar, KAERI (Muju, March, 2013)

- Workshop on the Advanced Monte Carlo Methodology, SNU (SNU, December, 2012)
- 2012 Summer school for high performance computing, KISTI & UNIST Supercomputing center (UNIST, July, 2013)
- Linux, Fortran Education , KISTI & PNU (PNU, June, 2012)
- SWARAM (SNU Workshop on Advanced Reactor Analysis Methods), SNU (SNU, February, 2012)
- Education reactor AGN-201K (10W) Experiment, Kyunghee University (KHU, February, 2012)
- Monte Carlo neutron analysis method and MCNP practical training, Kyunghee University (KHU, October, 2011)
- Membership
 - American Nuclear Society Student Member (March, 2012)
 - Korean Nuclear Society Student Member (September, 2011)

PUBLICATIONS SCI Journal

1. Sooyoung Choi, Kord S. Smith, Hanjoo Kim, **Taewoo Tak**, Deokjung Lee*, "On the Diffusion Coefficient Calculation in Two-step Light Water Reactor Core Analysis," *Journal of Computational Physics*, Submitted, 2016
2. Chidong Kong, Hyunsuk Lee, **Taewoo Tak**, Deokjung Lee*, Si Hwan Kim and, Seokjean Lyoo, "Accuracy Improvement of Boron Meter Adopting New Fitting Function and Multi-Detector," *Nuclear Engineering and Technology*, available online Jul 2016
3. Jinsu Park, Hyunsuk Lee, **Taewoo Tak**, Ho Cheol Shin, and Deokjung Lee*, "Physics Study of CANDU Lattice with Coolant Void Reactivity Analysis," *Nuclear Engineering and Technology*, available online Jul 2016
4. Jinsu Park, **Taewoo Tak**, T. K. Kim, Jiwon Choe, Yongjin Jeong, and Deokjung Lee*, "Design Study of Long-Life Small Modular Sodium-Cooled Fast Reactor," *International Journal of Energy Research*, DOI: 10.1002/er.3609, Jul 2016
5. Taewoo Tak, Youqi Zheng, Deokjung Lee*, and T. K. Kim, "Power Flattening Study of Ultra-Long Cycle Fast Reactor Using Thorium Fuel" *International Journal of Energy Research*, DOI: 10.1002/er.3552, May 2016
6. Taewoo Tak, Jiwon Choe, Yongjin Jeong, Deokjung Lee*, T. K. Kim, and Ser Gi Hong, "Feasibility study on ultralong-cycle operation and material performance for compact liquid metal-cooled fast reactors: a review work," *International Journal of Energy Research*, **Vol. 39**, No. 14, pp. 1859-1878, November, 2015
7. Taewoo Tak, Deokjung Lee*, T. K. Kim, and Ser Gi Hong, "Optimization study of Ultra-long Cycle Fast Reactor core concept," *Annals of Nuclear Energy*, **Vol. 73**, pp. 145-161, November, 2014

8. Taewoo Tak, Deokjung Lee*, and T.K. Kim, "Design of Ultra-long Cycle Fast Reactor Employing Breed-and-burn Strategy," *Nuclear Technology*, **Vol. 183**, pp. 427-435, September, 2013

International Topical Meeting

1. Jinsu Park, **Taewoo Tak**, Jiwon Choe, Yongjin Jeong, and Deokjung Lee*, and T. K. Kim, "Long-Life Small Modular Sodium-Cooled Fast Reactor Core Design with Breed-And-Burn Strategy," *PHYSOR 2016 – Unifying Theory and Experiments in the 21st Century*, Sun Valley, Idaho, USA, May 1 – 5, 2016
2. Taewoo Tak, Jiwon Choe, Yongjin Jeong, Jinsu Park, Deokjung Lee* and T. K. Kim, "Power Flattening Study of Ultra-Long Cycle Fast Reactor Core," *Thorium Energy Conference 2015 (ThEC15)*, Mumbai, India, October 19-22, 2015
3. Jinsu Park, **Taewoo Tak**, Jiwon Choe, Yongjin Jeong, Deokjung Lee*, and T. K. Kim, "Comparison of Predicted Breed-and-Burn Evaluation of a Small Modular Sodium-Cooled Fast Reactor with Several Code Systems," *Proceedings of the Reactor Physics Asia 2015 (RPHA15) Conference*, Jeju, Korea, September 16-18, 2015
4. Taewoo Tak, Jiwon Choe, Yongjin Jeong, Deokjung Lee, and T. K. Kim, "Study for Requirement of Advanced Long Life Small Modular Fast Reactor," *iNuSTEC2015*, Nilai, Malaysia, August 17-19, 2015
5. Taewoo Tak and Deokjung Lee, and T. K. Kim, "Optimization of Ultra-Long Cycle Fast Reactor Core," *PHYSOR2014*, Kyoto, Japan, September 28 – October 3, 2014
6. Taewoo Tak, Jiwon Choe, and Deokjung Lee, "Power Flattening and Breeding Performance Study for UCFR Loading Thorium Fuel," *The 19th Pacific Basin Nuclear Conference (PBNC 2014)*, Vancouver, British Columbia, Canada, August 24-28, 2014
7. CHOE Jiwon, PARK Minyong, CHOI Sooyoung, **TAK Taewoo**, and LEE Deokjung, "Upgrade of Mode-K Strategy for Load-Follow Operation of OPR1000," International Symposium on Symbiotic Nuclear Power Systems for the 21st Century (ISSNP2013), November 22-24, Beijing, China, 2013
8. Taewoo Tak, Hyunsuk Lee, Sooyoung Choi and Deokjung Lee, "Design of Small-size Ultra-long Cycle Fast Reactor with PWR Spent Fuel," *Proc. ICAPP 2013*, Jeju Island, Korea, April 14-18, 2013
9. Taewoo Tak, Deokjung Lee, and T.K. Kim, "Core Design Study of Ultra-long Cycle Fast Reactor Concept," *International Conference on Fast Reactors and Related Fuel Cycles (FR13)*, Paris, France, March 4-7, 2013
10. Tae Woo Tak, Hwanyael Yu, Ji Hyun Kim, Deokjung Lee, and T.K. Kim, "Preliminary Design of Ultra-long Cycle Fast Reactor Employing Breed-and-burn Strategy," *PHYSOR2012*, Knoxville, Tennessee, USA,

April 15-20, 2012

International and Domestic Conferences

1. Taewoo Tak, Jinsu Park, Jiwon Choe, Deokjung Lee, Thomas. H. Fanning, Tyler Sumner, Guanheng Zhang, T. K. Kim, "Anticipated Transient without Scram Assessment of SM-SFR using SAS4A/SASSYS-1," *Transactions of the Korean Nuclear Society Autumn Meeting*, Gyeongju, Korea, October 27-28, 2016
2. Jiwon Choe, Youqi Zheng, **Taewoo Tak**, Deokjung Lee, Ho Cheol Shin and Ji-Eun Jung, "Axial Region Optimization for Cycle Length Extension of Small Modular PWR," *Transactions of the Korean Nuclear Society Spring Meeting*, Jeju, Korea, May 11-13, 2016
3. Jinsu Park, Hyunsuk Lee, **Taewoo Tak**, and Deokjung Lee, "Coolant Void Reactivity Analysis of CANDU Lattice," *Transactions of the Korean Nuclear Society Spring Meeting*, Jeju, Korea, May 11-13, 2016
4. Taewoo Tak and Deokjung Lee, "Study on Burning Strategy for Small-size Sodium-cooled Fast Reactor," *Transactions of the American Nuclear Society Summer meeting*, San Antonio, TX, June 7-11, 2015
5. Taewoo Tak, Jiwon Choe, Yongjin Jeong, Deokjung Lee, T. K. Kim, "Preliminary Study for Conceptual Design of Advanced Long Life Small Modular Fast Reactor," *Transactions of the Korean Nuclear Society Autumn Meeting*, Jeju, Korea, May 7-8, 2015
6. Jiwon Choe, **Taewoo Tak**, Yongjin Jeong, Deokjung Lee, and Taek Kyum Kim, "The Impact of Thorium Blanket on Long-Life Fast Reactor Core Performance Characteristics," *Asian Nuclear Prospects (ANUP) 2014*, Jeju Island, Korea, November 9-12, 2014
7. Taewoo Tak and Deokjung Lee, "Flattening of UCFR Power Distribution with Fuel Zoning," *Transactions of the Korean Nuclear Society Autumn Meeting*, Pyeongchang, Korea, October 30-31, 2014
8. Taewoo Tak and Deokjung Lee, "Optimization Study of Ultra-long Cycle Fast Reactor Core," *Transactions of the Korean Nuclear Society Spring Meeting*, Jeju, Korea, May 29-30, 2014
9. Jiwon Choe, Minyong Park, Sooyoung Choi, **Taewoo Tak**, and Deokjung Lee, "Application of Mode-K Strategy to Daily Load-follow operation of OPR-1000," *Transactions of the American Nuclear Society Winter meeting*, Washington D.C., Washington D.C., November 10-14, 2013
10. Taewoo Tak, Jiwon Choe, Hyunsuk Lee, and Deokjung Lee, "Verification of UCFR-100 Depletion Calculation with Deterministic Method by

- Comparing with Probabilistic Method," *Transactions of the American Nuclear Society Winter meeting*, Washington D.C., November 10-14, 2013
11. Taewoo Tak, Chidong Kong, Jiwon Choe, and Deokjung Lee, "Reflector Performance Study in Ultra-long Cycle Fast Reactor," *Transactions of the Korean Nuclear Society Autumn Meeting*, Gyeongju, Korea, October 23-25, 2013
 12. Taewoo Tak, Hyunsuk Lee, Sooyoung Choi, Deokjung Lee, "Power Flattening Study for Ultra-long Cycle Fast Reactor UCFR-1000," *Transactions of the American Nuclear Society Summer meeting*, Atlanta, GA, USA, June 16-20, 2013
 13. Taewoo Tak and Deokjung Lee, "Design of Small-size Ultra-long cycle Fast Reactor UCFR-100," *Transactions of the American Nuclear Society Winter Meeting*, San Diego, CA, USA, November 11-15, 2012
 14. Taewoo Tak and Deokjung Lee, "A Study for Verifying Dynamic Characteristics of UCFR-1000 by Testing a Fuel Assembly," *Transactions of the Korean Nuclear Society Autumn Meeting*, Gyeongju, Korea, October 25-26, 2012
 15. Tae Woo Tak and Deokjung Lee, "Design of Ultra-long Cycle Fast Reactor with PWR Spent Fuel," *Transactions of the Korean Nuclear Society Spring Meeting*, Jeju, Korea, May 17-18, 2012