VLADIMIR SOBES

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EDUCATION

Massachusetts Institute of Technology Feb. 2011 - Sept. 2013
Ph.D. Nuclear Science and Engineering
Thesis: Coupled Differential and Integral Data Analysis for Improved Uncertainty Quantification of the ^{63,65}Cu Cross Section Evaluations
Overall GPA: 4.8/5.0

Massachusetts Institute of Technology Sept. 2007 - Feb. 2011
B.S. Nuclear Science and Engineering
Overall GPA: 5.0/5.0

- Nominated to the National Society of Collegiate Scholars
- Irving Kaplan Award for academic achievement by a junior in Nuclear Science and Engineering
- 5 Letters of Commendation from the Head of Department of Nuclear Science and Engineering for Academic Excellence

TECHNICAL STRENGTHS

Foreign Language Skills	Fluently bilingual in English and Russian, 1 year French studies
Computer Codes	SAMMY, AMPX, NJOY, SCALE, MCNP, MCODE
Computer Languages	C++, MATLAB, Basic FORTRAN

NATIONAL RECOGNITION

Nuclear Criticality Safety Program Technical Program Review Mar. 15 - 16, 2016
Best Paper Award *Albuquerque, NM*

- "Improvements for the ^{63,65}Cu Resonance Evaluations for Criticality Safety Applications" selected as the best research paper from the US DOE Nuclear Criticality Safety Program for Fiscal Year 2015.

Nuclear Criticality Safety Program Technical Program Review Mar. 18 - 19, 2015
Best Paper Award *Livermore, CA*

- "Nuclear Data Adjustment with SAMMY Based on Integral Experiments" selected as the best research paper from the US DOE Nuclear Criticality Safety Program for Fiscal Year 2014.

PROFESSIONAL MEMBERSHIPS

OECD/NEA WPEC Subgroup 39 Dec. 2015 - Present
Member

- Active member of OECD/NEA Working Party for Evaluation Cooperation (WPEC) Subgroup 39 on "Methods and approaches to provide feedback from nuclear and covariance data adjustment for improvement of nuclear data files."
- Working group is focused on improving the nuclear data adjustment methodology for advanced reactor applications.

American Nuclear Society Sept. 2010 - Present
National Member

· Education Committee Member for Nuclear Criticality Safety Division
· Technical Program Committee Member for Nuclear Criticality Safety Division

PROFESSIONAL DEVELOPMENT

Nuclear Criticality Safety Hands-On Training Course Feb. 1 - 12, 2016
Sandia National Laboratory *Albuquerque, NM*

· Experimental hands-on training addressing important characteristics of neutron-multiplying systems.
· Theory and implications for safety of fissionable material operations.
· Understanding of DOE mandates developed specifically for criticality safety professionals regarding application of DOE Orders, Guides, Rules, and ANS standards in performance of criticality safety evaluations.

Modeling Experimentation and Validation (MeV) Summer School Jun. 20 - 30, 2015
Argonne National Laboratory *Lemont, IL*

· Advanced studies in integrated modeling, experimentation, and validation to prepare students for some of the key challenges and demands facing the nuclear energy renaissance.

Criticality Safety Calculations SCALE Training Course Jan. 27 - 31, 2014
Oak Ridge National Laboratory *Oak Ridge, TN*

· Introductory through advanced criticality calculations using KENO V.a and KENO-VI in continuous energy and multi-group formalism using resonance self-shielding techniques.

WORK EXPERIENCE

ORNL Research and Development Staff Oct. 2015 - Present
Nuclear Data and Criticality Safety Group, Reactor and Nuclear Systems Division *Oak Ridge, TN*
Reference: Dr. Michael E. Dunn · (865) 574 - 5260 · dunnme@ornl.gov

ORNL Postdoctoral Research Associate Nov 2013 - Sept. 2015
Nuclear Data Specialist *Oak Ridge, TN*

· Developed a coupling methodology between differential nuclear data analysis and integral benchmark experiments entirely using continuous energy formalism.
· Developed a statistical inference methodology for upper subcritical limit calculations based on correlated experimental data.
· Analyzed the feasibility of direct disposal of spent nuclear fuel in a geologic repository from a criticality safety standpoint.

ORNL Nuclear Engineering Science Laboratory Synthesis (NESLS) May 2013 - Aug. 2013
Summer Intern Researcher *Oak Ridge, TN*

· Developed a methodology for coupling of differential and integral data analysis for neutron resonance region evaluations.
· Coupled the sensitivity/uncertainty analysis codes TSUNAMI/TSURFER with R-Matrix theory code SAMMY using a C++ program.
· Studied double differential nuclear data and its impacts on criticality safety benchmarks.
· Developed a C++ processing code for scattering angular distributions.

ORNL Nuclear Engineering Science Laboratory Synthesis (NESLS) May 2012 - Aug. 2012
Summer Intern Researcher *Oak Ridge, TN*

· Applied R-Matrix theory to evaluate experimental nuclear data and created a new resolved resonance region evaluation for ^{63,65}Cu proposed for submission to the ENDF nuclear data library.

ORNL Nuclear Engineering Science Laboratory Synthesis (NESLS) May 2010 - Aug. 2010
Summer Intern Researcher *Oak Ridge, TN*

· Studied a comparison of processing the new ^{240}Pu resonance and covariance evaluation using the NJOY and AMPX processing codes.
· Tested new evaluations using MCNP and the radiation transport codes.

MIT Reactor Physics Analysis of GNEP Fast Reactor Design Jan. 2010 - May 2010
Undergraduate Researcher *Cambridge, MA*

· Modeled different spent fuel blanket designs and accessed their effectiveness as part of a fuel cycle study.
· Validated a deterministic fast reactor code, ERANOS, by a stochastic neutron transport code, MCNP5.

MIT Reactor Physics Analysis of Pebble Bed Reactors Sept. 2008 - Dec. 2009
Undergraduate Researcher *Cambridge, MA*

· Independently designed, built, and analyzed computational experiments to evaluate the safety of PBMRs, using MCNP5, ORIGEN, and MCODE depletion calculations.
· Performed heat transfer analysis based on neutronics calculations to compute temperature peaking factors.

INVITED TALKS

Postdoctoral Experience at a National Laboratory:
A Nuclear Engineering Perspective Nov. 12, 2015
ANS Winter Meeting and Technology Expo *Washington, D.C.*

· Discussed the DOE National Laboratory Postdoctoral Research program which offers the opportunity for appointees to perform research in a robust scientific R&D environment, present and publish research, advance knowledge in basic and applied science, and strengthen national scientific and technical capabilities.

ACADEMIC EXPERIENCE

MIT Nuclear Data Course Jan. 2014 - Present (Annually)
Visiting Lecturer *Cambridge, MA*

· Designed and taught a week-long course on nuclear data at the graduate level.
· 15 hours of lecture, 4 hours of recitation, 4 comprehensive homework sets.
· Attended by over 25 graduate students from Department of Nuclear Science and Engineering and Department of Physics.
· Attended by 6 research staff from US Naval Nuclear Laboratories.
· *Reference: Prof. Benoit Forget · (617) 253 - 1655 · bforget@mit.edu*

SCALE Training Course Mar. 9, 2016
Guest Lecturer *Oak Ridge, TN*

· Taught a guest lecture in the SCALE Sensitivity/Uncertainty Analysis and Uncertainty Quantification Calculations class on the topic of Upper Subcritical Limit calculations.

CNEC Summer Student Mentor Jun. 2016 - Aug. 2016
Summer Student: Pola-Lydia Lagari (Purdue University) *Oak Ridge, TN*

· Mentored a Consortium for Nonproliferation Enabling Capabilities (CNEC) fellow student.
· *Project Tittle:* Nuclear Resonance Characterization for Special Nuclear Material Detection and Identification.

ENEC Summer Student Mentor Jun. 2016 - Aug. 2016
Summer Student: Abdulla Abdulaziz Alhajri (MIT) *Oak Ridge, TN*

· Mentored an Emirates Nuclear Energy Corporation (ENEC) fellow student.
· *Project Tittle:* Resonance Parameter Sensitivities Calculations with SCALE.

CASL Summer Student Mentor Jun. 2015 - Aug. 2015
Summer Student: Pablo Ducru (MIT) *Oak Ridge, TN*

· Mentored a Consortium for Advanced Simulation of LWRs summer student.
· *Project Tittle:* Multipole Representation; A Cross Section Formalism for High-Fidelity on-the-fly Thermohydraulics-Neutronics Coupling.
· Winner of 1st place in the 2015 Summer Student Research Expo.

UROP Student Mentor Sept. 2011 - Dec. 2012
Undergraduate Researcher: Ekaterina Paramanova (MIT) *Cambridge, MA*

· Mentored an Undergraduate Research Opportunity Project (UROP) student.
· *Project Tittle:* Radiative Capture Cross Section Measurement for Copper in the Thermal Energy Region for Inclusion in the EXFOR Database.
· Presented at 2012 American Nuclear Society Winter Meeting and Nuclear Technology Expo.

UROP Student Mentor Sept. 2010 - May 2011
Undergraduate Researcher: Ruaridh Macdonald (MIT) *Cambridge, MA*

· Mentored an Undergraduate Research Opportunity Project (UROP) student.
· *Project Tittle:* Total Cross Section Measurement for ^{63,65}Cu in the 0.001 eV - 100 eV Energy Region.
· Presented at 2011 American Nuclear Society Winter Meeting and Nuclear Technology Expo.

JOURNAL PUBLICATIONS

· V. Sobes, et al., **Application of the SAMINT Methodology to the New Cross-Section Evaluations of Cu-63 and Cu-65**, *Nuclear Data Sheets (accepted for publication)*, Jan (2017).

· V. Sobes, L. Leal, G. Arbanas, B. Forget, **Resonance Parameter Adjustment Based on Integral Experiments**, *Nuclear Science and Engineering*, **183**(3), Jul. (2016).

· V. Sobes, L. Leal, B. Forget, K. Guber, **New Resolved Resonance Region Evaluations for ^{63}Cu and ^{65}Cu to Support Nuclear Criticality Safety Analyses**, *Nuclear Data Sheets*, **115**, Mar. (2014).

· P. Pereslavtsev, A. Konobeyev, U. Fischer, V. Sobes, L. Leal, **New Evaluation of n+^{63,65}Cu Nuclear Cross Section Data up to 200 MeV Neutron Energy**, *Nuclear Data Sheets*, **115**, Mar. (2014).

· V. Sobes, B. Forget, A. Kadak, **Individual Pebble Temperature Peaking Factor due to Local Pebble Arrangement in a Pebble Bed Reactor Core**, *Nuclear Engineering and Design*, **241**(1), Jan. (2011).

LABORATORY REPORTS

· V. Sobes, et al., **Processing and Testing New 240Pu Resolved Resonance Evaluation for Fuel Cycle Applications**, *ORNL/TM-2016/XX*, May (2016).

· V. Sobes, L. Leal, **IRSN-ORNL Cooperation on Nuclear Data and Criticality Safety Summary Report**, *IRSN Laboratory Report*, Dec. (2015).

· V. Sobes, J. Scaglione, M. Dunn, **Validation Study for Crediting Chlorine in Criticality Analyses for US Spent Nuclear Fuel Disposition**, Prepared for US DOE Used Fuel Disposition Campaign, *FCRD-UFD-2015-00638*, Dec. (2014).

· Bean, Malcolm K., ... , V. Sobes, et al., **Conceptual Design of Molten Salt Loop Experiment for MIT Research Reactor**, Center for Advanced Nuclear Energy Systems. MIT Reactor Redesign Program, *MIT Press*, (2011).

PEER-REVIEWED CONFERENCE PUBLICATIONS

· V. Sobes, K. Guber, et al., **Calculated Resonance Properties from the New Resolved Resonance Region Evaluations of Copper**, *The 2016 R-Matrix Workshop on Methods and Applications*, Jun. (2016).

· V. Sobes, L. Leal, **Benchmarking of the Updated Resolved Resonance Region Evaluations of Copper**, *Trans. Am. Nucl. Soc.*, **114**, Jun. (2016).

· P. Ducru, V. Sobes, B. Forget, K. Smith, **On Methods for Conversion of R-Matrix Resonance Parameters to Multi-pole Formalism - Numerics of Algebraic Conversion**, *PHYSOR 2016*, May (2016).

· V. Sobes, et al., **SAMINT: A New Evaluation Tool to Perform Resonance Parameter Data Adjustments based on Integral Experiment Data**, *Trans. Am. Nucl. Soc.*, **113**, Nov. (2015).

· P. Ducru, C. Josey, V. Sobes, et al., **Doppler Broadening by Linear Combination of Reference Temperature Cross Sections**, *Trans. Am. Nucl. Soc.*, **113**, Nov. (2015).

· V. Sobes, B. Rearden, et al., **Upper Subcritical Calculations Based on Correlated Data**, *Trans. of Int. Conf. on Nucl. Crit. Safety*, Sept. (2015).

· V. Sobes, L. Leal, G. Arbanas, **Nuclear Data Adjustment with SAMMY Based on Integral Experiments**, *Trans. Am. Nucl. Soc.*, **111**, Nov. (2014).

· L. Leal, V. Sobes, et al., **ORNL Nuclear Data Evaluation Accomplishments for FY2013**, *Trans. Am. Nucl. Soc.*, **111**, Nov. (2014).

· V. Sobes, L. Leal, **Results for the Intermediate-Spectrum Zeus Benchmark Obtained with New ^{63,65}Cu Cross-Section Evaluations**, *Trans. Am. Nucl. Soc.*, **110**, Jun. (2014).

· V. Sobes, L. Leal, B. Forget, **Coupled Differential and Integral Data Analysis for Improved Uncertainty Quantification**, *Trans. Am. Nucl. Soc.*, **109**, Nov. (2013).

· E. Paramanova, V. Sobes, B. Forget, G. Kohse, **Radiative Capture Cross Section Measurement of Copper for EXFOR Database**, *Trans. Am. Nucl. Soc.*, **107**, Nov. (2012).

· V. Sobes, L. Leal, K. Guber, B. Forget, **Preliminary Resolved Resonance Region Evaluation of Copper-63 from 0 to 300 keV**, *PHYSOR 2012*, Apr. (2012).

· V. Sobes, R. Macdonald, L. Leal, B. Forget, K. Guber, G. Kohse, **Thermal Total Cross Section Measurement for ^{63}Cu and ^{65}Cu at the MIT Reactor**, *Trans. Am. Nucl. Soc.*, **106**, Nov. (2011).

· V. Sobes, L. Leal, H. Derrien, D. Wiarda, D. Muller, B. Forget, **Processing and Testing New ^{240}Pu Resolved Resonance and Covariance Evaluation**, *Trans. Am. Nucl. Soc.*, **105**, Jun. (2011).