Luiz Carlos Leal

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EDUCATION

The University of Tennessee, Knoxville
Ph.D. in Nuclear Engineering, May 1990

Federal University of Rio de Janeiro, Brazil
M.Sc. in Nuclear Engineering, June 1980

Federal University of Rio de Janeiro, Brazil
B.Sc. in Physics, December 1977

WORK EXPERIENCE

2011–Present **Research Affiliate**
Nuclear Engineering Department, Massachusetts Institute of Technology, Boston, MA
(http://web.mit.edu/bin/cgicso?query=alias%3DL-leal)

2004–Present **Distinguished R&D Staff**
Nuclear Data and Criticality Safety Group, Reactor and Nuclear Systems Division, Oak Ridge National Laboratory, Oak Ridge, TN

2001–2004 **Senior Research Development Staff Member**
Nuclear Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, TN
Acted as the technical director of the nuclear data activities in support of the DOE Nuclear Criticality Safety Program.

1996–2001 **Senior Nuclear Engineer**
Radiation Information Analysis Section and Leader, Nuclear Data Group, Oak Ridge National Laboratory, Oak Ridge, TN
Responsible for nuclear data measurement and evaluation at the Oak Ridge Linear Accelerator (ORELA). Responsible for nuclear data evaluations presently in the US Evaluated Nuclear Data Files.

1993–1996 **Nuclear Engineer**
Radiation Information Analysis Section, Nuclear Data Group, Oak Ridge National Laboratory, Oak Ridge, TN

1990–1993 **Nuclear Engineer**
Theory and Analyses Group of the Reactor Analysis Division, Argonne National Laboratory, Argonne, IL

WORK EXPERIENCE (continued)

Activities included processing of the newly released nuclear data file (ENDF/B version VI) for reactor analyses, development of new techniques for resonance treatment for the ENDF/B-VI neutron cross-section representation, processing of data for photon interaction for reactor calculations, reactor core analysis and design, cross section generation, and static and dynamic analysis utilizing deterministic and Monte Carlo codes.

1986–1990 **Graduate Research Assistant**
Engineering Physics and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge, TN
Performed the R-matrix analysis and evaluation of the ^{235}U neutron cross-sections in the resolved energy range. The ENDF/B-VI data files have subsequently adopted the resulting resolved resonance parameters. Developed a computer code for treating the neutron interaction cross section in the unresolved energy range.

1985–1986 **Research Assistant**
Applied Physics Division, Argonne National Laboratory, Argonne, IL
Worked on processing of neutron cross sections. Work included the development of a finite difference algorithm applied to the Doppler broadening of cross sections.

1980–1985 **Nuclear Engineer**
Brazilian Nuclear Energy Commission
Responsible for development, applications, and implementation of computer codes for nuclear reactor design and analysis.

1979–1980 **Assistant Professor**
Physics Department, Federal University of Paraiba, Brazil

1977–1979 **Research Assistant**
Nuclear Engineering Department, Federal University of Rio de Janeiro
Developed algorithms for calculating neutron scattering kernel in light and heavy water (H_20 and D_20) based on the Nelkin and Butler model.

PROFESSIONAL AFFILIATIONS

Fellow of the American Nuclear Society

(A) Reactor Physics Division

Session Organizer, International Conference on Mathematics and Computations, Reactor Physics, and Environmental Analyses, Portland, Oregon, April 1995

Session Organizer, Physics of Nuclear Science and Technology, Long Island, New York, October 1998

International Program Committee on the International Conference on Nuclear Data for Science and Technology, Tsukuba, Ibaraki, Japan, October 2001

PROFESSIONAL AFFILIATIONS (continued)

International Program Committee and Session organizer for PHYSOR 2002 Seoul, South Korea, October 2002
Session Organizer of several ANS Annual Meetings

(B) Mathematics and Computation Division

International Program Committee and Session Organizer, Mathematics and Computation Meeting, Gatlinburg, Tennessee, April 2003

(C) Criticality Safety Division

Session Organizer, International Conference on Criticality Safety, Palais des Congres, Versailles, France September 1999

OTHER PROFESSIONAL ACTIVITIES

Ph.D. Thesis Advisor and Committee participant at Institut Polytechnique de Grenoble, France. Ph.D. Thesis presented by Benoit Habert, November 2009.

Committee member of the defense for "Habilitation a Diriger les Recherches," presented by Ivan Kodeli at the University of Orsay, Paris, France.

Ph.D. Thesis Advisor and Committee participant at The Pennsylvania State University. Ph.D. Thesis presented by F. Arzu Alpan, November 2003.

Lecturer at the International Centre for Theoretical Physics, lecture presented at the Workshop on Nuclear Data and Nuclear Reactors: Physics, Design and Safety, Trieste, Italy, March 2000.

Lecturer at the Massachusetts Institute of Technology (MIT). Subject: R-matrix theory and nuclear data application to reactor design and criticality safety.

ANS Executive Committee Member of the Reactor Physics Division, 2001–2003.

AWARDS

2010 Technical Excellence Award winner in the Criticality Safety Division of the American Nuclear Society (http://ncsd.ans.org/site/awards.html).

Outstanding paper, "Finite Difference Method for Treating Doppler Broadening of Cross Sections," American Nuclear Society Eastern Regional Student Conference, Raleigh, NC, April 1987.

First place honors at the Student Design Contest Graduate Category, "Performance Analysis of the Browns Ferry Radwaste System," American Nuclear Society, Los Angeles, CA, November 1987.

Outstanding paper, "Statistical Properties of the ^{235}U Resonance Parameters Up to 300 eV," American Nuclear Society Eastern Regional Student Conference, Knoxville, TN, March 1989.

Fellowship of the International Atomic Energy Agency (IAEA), 1985–1986.

PUBLICATIONS

L. C. Leal, R. E. Macfarlane, A. Plompen, A. Negret, and C. Borcea, "^{56}Fe Resonance Evaluation up to 1.6 MeV," *WINS 2012*, Boston, MA, September 17-19, 2012.

L. C. Leal, K. H. Guber, D. Wiarda, G. Arbanas, and M. E. Dunn, "ORNL Resonance Evaluation for ENDF/B-VII.1," *Trans. Am. Nucl. Soc*. **106**, 784-785 (2012).

G. Arbanas, M. E. Dunn, N. M. Larson, L. C. Leal, M. L. Williams, B. Becker, and R. Dagan, "Convergence of Legendre Expansion of Doppler-Broadened Double-Differential Elastic Scattering Cross Section," *PHYSOR 2012 – Advances in Reactor Physics – Linking Research, Industry, and Education*, Knoxville, Tenn., April 15-20, 2012, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2012).

A. Santamarina, D. Bernard, N. Dos Santos, O. Leray, C. Vaglio and L. Leal, "Re-estimation of Nuclear Data and JEFF3.1.1 Uncertainty Calculations*," PHYSOR 2012 – Advances in Reactor Physics – Linking Research, Industry, and Education*, Knoxville, Tenn., April 15-20, 2012, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2012).

M. B. Chadwick et al., "ENDF/B-VII.1 Nuclear Data for Science and Technology: Cross Sections, Covariances, Fission Product Yields and Decay Data," *Nucl. Data Sheets* **112**(12), 2887-2996 (2011).

A. Trkov, R. Capote, E. Soukhovitskii, L. C. Leal, M. Sin, I. Kodeli, and D. W. Muir, "Covariances of Evaluated Nuclear Cross Section Data for ^{232}Th, ^{180,182,183,184,186}W and ^{55}Mn,"" *Nuclear Data Sheets* **112**(12), 3098-3119, December 2011.

L. C. Leal, H. Derrien, K. H. Guber, G. Arbanas, and D. Wiarda, "Evaluation of the Chromium Resonance Parameters Including Resonance Parameter Covariance," *Korean Phys. Soc*. **59**(2), 1644-1648, August 2011.

P. Pereslavtsev, A. Konobeyev, U. Fischer, and L. C. Leal, "Evaluation of ^{50}Cr, ^{52}Cr, ^{53}Cr, ^{54}Cr Neutron Cross Section Data for Energies up to 200 MeV," *Korean Phys. Soc*. **59**(2), 931-934, August 2011.

E. A. Read, L. C. Leal, K. C. Bledsoe, B. L. Kirk, and C. R. E. de Oliveira, "Nuclear Data Error Propagation in Fusion Benchmark Calculations," *Trans. Am. Nucl. Soc.* **105**, 464-465 (2011).

V. Sobes, R. Macdonald, L. Leal, B. Forget, K. Guber, and G. Kohse, "Thermal Total Cross Section Measurement for ^{63}Cu and ^{65}Cu at the MIT Reactor," *Trans. Am. Nucl. Soc.* **105**, 557-558 (2011).

M. E. Dunn, L. C. Leal, K. H. Guber, G. Arbanas, D. Wiarda, R. O. Sayer, H. Derrien, and J. Harvey, "Resonance Region Cross-Section Data Advancements for Nuclear Criticality Safety Applications," in *Proceedings of ICNC 2011*, Edinburgh, U.K., September 19-22, 2011.

K. H. Guber, L. C. Leal, C. Lampoudis, S. Kopecky, P. Schillebeeckx, F. Emiliani, R. Wynants, and P. Siegler, "New Improved Nuclear Data for Nuclear Criticality and Safety," in *Proceedings of ICNC 2011*, Edinburgh, U.K., September 19-22, 2011.

L. C. Leal, K. H. Guber, G. Arbanas, D. Wiarda, P. E. Koehler, and A. Kahler, "Resonance Evaluation of ^{48}Ti Including Covariance for Criticality Safety Applications," in *Proceedings of ICNC 2011*, Edinburgh, U.K., September 19-22, 2011.

G. Arbanas, B. Becker, R. Dagan, M. E. Dunn, N. M. Larson, L. C. Leal, and M. L. Williams, "Covariance Matrix of a Double-Differential Elastic Scattering Cross Section," presented at the 2nd Workshop on Neutron Cross Section Covariances, Vienna, Austria, September 14-16, 2011.

PUBLICATIONS (continued)

J. C. Holmes, I. I. Al-Qasir, A. I. Hawari, and L. C. Leal, "Development of an ENDF Thermal Library for SiO_2 and Testing of Criticality Effects," *Trans. Am. Nucl. Soc*. **104**, 438-439 (2011).

V. Sobes, L. Leal, H. Derrien, D. Wiarda, D. Mueller, and B. Forget, "Processing and Testing New ^{240}Pu Resolved Resonance and Covariance Evaluation," *Trans. Am. Nucl. Soc*. **104**, 780-782 (2011).

D. Wiarda, L. C. Leal, and M. E. Dunn, "Cross-Section Covariance Data Processing with the AMPX Module PUFF-IV" (invited), *Trans. Am. Nucl. Soc*. **104**, 772-773 (2011).

G. Arbanas, M. E. Dunn, N. M. Larson, L. C. Leal, M. L. Williams, B. Becker, and R. Dagan, "Computation of Temperature-Dependent Legendre Moments of a Double-Differential Elastic Cross Section," in *Proceedings of the International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2011)*, Rio de Janeiro, Brazil, May 8-12, 2011.

L. Leal and K. Shibata, *Assessment of the Unresolved Resonance Treatment for Cross-section and Covariance Representation*, Nuclear Science/NEA/WPEC-32, NEA/NSC/WPEC/DOC(2011)430, a report by the working Party of International Evaluation Co-operation of the NEA Nuclear Science Committee, Nuclear Energy Agency, Organisation for Economic Co-operation and Development, April 2011.

L. C. Leal, C. De Saint Jean, and G. Noguere, "Comparison of Resonance Parameter Covariance Generation Using CONRAD and SAMMY Computer Codes," *Trans. Am. Nucl. Soc*. **102**, 506-508 (2010).

K. H. Guber, H. Derrien, L. C. Leal, G. Arbanas, D. Wiarda, P. Koehler, and J. A. Harvey, "Astrophysical Reaction Rates for ^{58,60}Ni(n,γ) from New Neutron Capture Cross Section Measurements," *Phys. Rev. C* **82**, 057601 (2010).

B. Habert, C. De Saint Jean, L. C. Leal, and Y. Rugama, "Retroactive Generation of Covariance Matrix of Nuclear Model Parameters Using Marginalization Techniques," *Nucl. Sci. Eng.* **166**(3), 276-287, November 2010.

L. C. Leal, H. Derrien, C. De Saint Jean, G. Noguere, and J. M. Ruggieri, "Covariance Generation using CONRAD and SAMMY Computer Codes," in *Proceedings of Wonder 2009–2nd International Workshop on Nuclear Data Evaluation for Reactor Applications*, Cadarache, France, September 29-October 2, 2009.

H. Derrien, L. C. Leal, K. H. Guber, D. Wiarda, and G. Arbanas, "Reevaluation of ^{58}Ni and ^{60}Ni Resonance Parameters in the Energy Range Thermal to 800 keV" in *Proceedings of Wonder 2009–2nd International Workshop on Nuclear Data Evaluation for Reactor Applications*, Cadarache, France, September 29-October 2, 2009.

H. Derrien, L. C. Leal, and N. M. Larson, "R-Matrix Analysis of ^{238}U High Resolution Neutron Transmissions and Capture Cross Sections in the Energy Range 0 keV to 20 keV," *Nucl. Sci. Eng.* **161**(2), 131-159, February 2009.
L. C. Leal, G. Arbanas, H. Derrien, and D. Wiarda, "Resonance Region Covariance Analysis Method and New Covariance Data for Th-232, U-233, U-235, U-238, and Pu-239, *Nuclear Data Sheets* **109**(12), 2868-2873, December 2008.

A. Trkov, R. Capote, I. Kodeli, and L. C. Leal, "Evaluation of Tungsten Nuclear Reaction Data with Covariances," *Nuclear Data Sheets* **109**(12), 2905-2909, December 2008.
D. Wiarda, G. Arbanas, L. C. Leal, and M. E. Dunn, "Recent Advances with the AMPX Covariance Processing Capabilities in PUFF-IV," *Nuclear Data Sheets* **109**(12), 2791-2795, December 2008.

H. Derrien, L. C. Leal, and N. M. Larson, "R-Matrix Analysis of ^{232}Th Neutron Transmissions and Capture Cross Sections in the Energy Range Thermal to 4 keV," *Nucl. Sci. Eng.* **160**(2), 149-167, October 2008.

H. Derrien, L. C. Leal, N. M. Larson, K. H. Guber, D. Wiarda, and G. Arbanas, "Neutron Resonance Parameters of ^{55}Mn from Reich-Moore Analysis of Recent Experimental Neutron Transmission and Capture Cross Sections," in

PUBLICATIONS (continued)

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L. C. Leal, D. Mueller, G. Arbanas, D. Wiarda, H. Derrien, "Impact of the ^{235}U Covariance Data in Benchmark Calculations," in *Proceedings of PHYSOR 2008 – International Conference on the Physics of Reactor,* Interlaken, Switzerland, September 14-19, 2008.

H. Derrien, L. C. Leal, and N. M. Larson, *Neutron Resonance Parameters and Covariance Matrix of ^{239}Pu*, ORNL/TM-2008/123, Oak Ridge National Laboratory, Oak Ridge, Tenn., August 2008.

K. H. Guber, D. Wiarda, L. C. Leal, H. Derrien, C. Ausmus, D. Brashear, and J. A. White, "New Neutron-Induced Cross-Section Measurements for Weak s-process Studies," NIC X_214.pdf in *Proceedings of Science, 10th Symposium on Nuclei in the Cosmos*, Mackinac Island, Michigan, July 27–August 1, 2008.

L. C. Leal and C.-S. Gil, "Comparison of the Uncertainties of k_{eff} Using the Recently Developed Covariance Data," *Trans. Am. Nucl. Soc*. **98**, 207–208 (2008).

L. C. Leal, D. Wiarda, and G. Arbanas, "Covariance Representation in the Resonance Region: Application to ^{233}U," *Trans. Am. Nucl. Soc*. **98**, 651–653 (2008).

L. C. Leal, D. Wiarda, B. T. Rearden, and H. Derrien, *^{233}U Cross-Section and Covariance Data Update for SCALE 5.1 Libraries*, ORNL/TM-2007/115, Oak Ridge National Laboratory, Oak Ridge, Tenn., January 2008.

M. E. Dunn, G. Arbanas, L. C. Leal, and D. Wiarda, "Approximating large resonance parameter covariance matrices with group-wise covariance matrices for advanced nuclear fuel cycle applications," p. 139-142, NEMEA-4—Neutron Measurements, Evaluations and Applications, Nuclear Data Needs for Generation IV and Accelerator Driven Systems, in *Proceedings of the CANDIDE Workshop*, October 16–18, 2007, Prague, Czech Republic (January 2008).

L. C. Leal, H. Derrien, M. E. Dunn, and D. Mueller, *Assessment of Fission Product Cross-Section Data for Burnup Credit Applications*, ORNL/TM-2005/065, Oak Ridge National Laboratory, Oak Ridge, Tenn., December 2007.

C. Myers, B. L. Kirk, and L. C. Leal, "Comparative Analysis of Nuclear Cross Sections in Monte Carlo Methods for Medical Physics Applications," in *Proceedings of the Computational Medical Physics Working Group Workshop II*, Gainesville, FL, September 30-October 3, 2007.

L. Leal, R. Westfall, D. Eghbali, and F. Trumble, "Assessment of Titanium Cross Sections and Uncertainties for Application in Criticality Safety," p. 50–52 in *Proceedings of the 8th International Conference on Nuclear Criticality Safety (ICNC 2007)*, Vol. II, St. Petersburg, Russia, May 28–June 1, 2007.

L. Leal, H. Derrien, N. Larson, G. Arbanas, and R. Sayer, "ORNL Methodology for Covariance Generation for Sensitivity/Uncertainty Analysis," p. 25–29 in *Proceedings of the 8th International Conference on Nuclear Criticality Safety (ICNC 2007)*, Vol. II, St. Petersburg, Russia, May 28–June 1, 2007.

R. Capote, A. Trkov, I. Kodeli, E. Soukhovitskii, L. C. Leal, M. Herman, and D. Muir, "Evaluation of Cross Sections of Tungsten Isotopes Including Covariance Estimation," in *Proceedings of International Conference on Nuclear Data for Science and Technology (ND 2007)*, Nice, France, April 22–27, 2007.

H. Derrien, L. C. Leal, and N. M. Larson, "^{239}Pu Neutron Resonance Parameters Revisited and the Covariance Matrix in the Neutron Energy Range Thermal to 2.5 keV," in *Proceedings of International Conference on Nuclear Data for Science and Technology (ND-2007)*, Nice, France, April 22–27, 2007.

PUBLICATIONS (continued)

M. E. Dunn, N. M. Larson, H. Derrien, and L. C. Leal, "Perspective on Advances in Resonance-Region Nuclear Modeling and Opportunities for Future Research," invited paper in *Proceedings of International Conference on Nuclear Data for Science and Technology (ND 2007)*, Nice, France, April 22–27, 2007.

K. H. Guber, P. Koehler, D. Wiarda, J. A. Harvey, T. E. Valentine, R. O. Sayer, L. C. Leal, N. M. Larson, and T. S. Bigelow, "New Neutron Cross-Section Measurements from ORELA and New Resonance Parameter Evaluations," in *Proceedings of International Conference on Nuclear Data for Science and Technology (ND 2007)*, Nice, France, April 22–27, 2007.

N. M. Larson, L. C. Leal, R. O. Sayer, H. Derrien, D. Wiarda, and G. Arbanas, "Current Status of the R-Matrix Code SAMMY, with Emphasis on the Relationship to ENDF Formats," in *Proceedings of International Conference on Nuclear Data for Science and Technology (ND 2007)*, Nice, France, April 22–27, 2007.

L. C. Mihailescu, I. Sirakov, R. Capote, A. Borella, K. H. Guber, S. Kopecky, L. C. Leal, P. Schillebeeckx, P. Siegler, R. Wynants, and E. Soukhovitskii, "Evaluation of the ^{103}Rh Neutron Cross Section Data in the Unresolved Resonance Region for Improved Criticality Safety," in *Proceedings of International Conference on Nuclear Data for Science and Technology (ND 2007)*, Nice, France, April 22–27, 2007.

L. Leal and H. Derrien, "Evaluation of ^{231}Pa and ^{233}Pa Resonance Parameters and Covariance in the Resolved Resonance Region," *Trans. Am. Nucl. Soc*. **95**, 768–769 (2006).

D. Wiarda, M. E. Dunn, N. M. Larson, and L. C. Leal, "Processing of ENDF/B-VII Covariance Data for Use of Sensitivity/Uncertainty Analysis," *Trans. Am. Nucl. Soc*. **95**, 290–291 (2006).

H. Derrien, L. C. Leal, and N. M. Larson, *Evaluation of ^{232}Th Neutron Resonance Parameters in the Energy Range 0 keV to 4000 keV*, ORNL/TM-2006/53, Oak Ridge National Laboratory, Oak Ridge, Tenn., October 2006.

L. Leal, H. Derrien, G. Arbanas, N. Larson, and D. Wiarda, "Covariance Data for ^{232}Th in the Resolved Resonance Region 0 to 4 keV," in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation, Vancouver, British Columbia, Canada, September 10–14, 2006.

G. Arbanas, L. C. Leal, N. M. Larson, and H. Derrien, "Retroactive Covariance Matrix for 235U in the Resolved-Resonance Region," in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation, Vancouver, British Columbia, Canada, September 10–14, 2006.

H. Derrien, L. C. Leal, and N. M. Larson, "New Evaluation of the ^{232}Th Neutron Resonance Parameters in the Energy Range 0 to 4000 keV," in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation, Vancouver, British Columbia, Canada, September 10–14, 2006.

D. Wiarda, M. E. Dunn, N. M. Greene, N. M. Larson, and L. C. Leal, "New Capabilities for Processing Covariance Data in Resonance Region," in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation, Vancouver, British Columbia, Canada, September 10–14, 2006.

K. H. Guber, L. C. Leal, R. O. Sayer, P. E. Koehler, D. Wiarda, T. E. Valentine, H. Derrien, J. A. Harvey, S. Kopecky, P. Siegler, P. Schillebeeckx, R. Wynants, I. Ivanov, A. Borella, R. Nelson, M. Devlin, and N. Fotiadis, "New Neutron Cross-Section Measurements on ^{19}F, ^{39,41}K, ^{55}Mn, and ^{103}Rh for Improved Nuclear Criticality Safety," C033.pdf in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation, Vancouver, British Columbia, Canada, September 10–14, 2006.

PUBLICATIONS (continued)

M. Herman, P. Oblozinsky, D. Rochman, T. Kawano, and L. Leal, "Fast Neutron Covariances for Evaluated Data Files," in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation, Vancouver, British Columbia, Canada, September 10–14, 2006.

N. M. Larson, L. C. Leal, H. Derrien, G. Arbanas, R. O. Sayer, and D. Wiarda, "A Systematic Description of the Generation of Covariance Matrices," in *Proceedings of PHYSOR 2006*, American Nuclear Society Topical Meeting on Reactor Physics: Advances in Nuclear Analysis and Simulation,Vancouver, British Columbia, Canada, September 10–14, 2006.

R. O. Sayer, K. H. Guber, L. C. Leal, N. M. Larson, and T. Rauscher "R-Matrix Analysis of C1 Neutron Cross Sections up to 1.2 MeV," *Phys. Rev. C* **73**, 044603 (2006).

K. H. Guber, L. C. Leal, R. O. Sayer, P. E. Koehler, H. Derrien, D. Wiarda, and J. A. Harvey, "Neutron Cross-Section Measurements at ORELA," pp. 25–34 in *Proceedings of the Oak Ridge Electron Linear Accelerator (ORELA) Workshop*, held at Oak Ridge National Laboratory, Oak Ridge, Tennessee, July 14–15, 2005; ORNL/TM-2005/272, comp. Michael E. Dunn, Oak Ridge National Laboratory, Oak Ridge, Tenn., February 2006.

L. C. Leal, G. Arbanas, H. Derrien, N. M. Larson, and B. Rearden, "Covariance Data for ^{233}U in the Resolved Resonance Region for Criticality Safety Applications," 262.pdf in *Proceedings of M&C 2005 International Topical Meeting on Mathematics and Computation, Supercomputing, Reactor Physics and Nuclear and Biological Applications*, Palais Des Papes, Avignon, France, September 12–15, 2005, on CD-ROM, American Nuclear Society, LaGrange Park, Illinois (2005).

A. Courcelle, H. Derrien, L. Leal, and N. Larson, "Analysis of the ^{238}U Resonance Parameters Using Random-Matrix Theory," 167.pdf in *Proceedings of M&C 2005 International Topical Meeting on Mathematics and Computation, Supercomputing, Reactor Physics and Nuclear and Biological Applications*, Palais Des Papes, Avignon, France, September 12–15, 2005, on CD-ROM, American Nuclear Society, LaGrange Park, Illinois (2005).

L. C. Leal, H. Derrien, N. M. Larson , and A. Courcelle, "An Unresolved Resonance Evaluation for ^{233}U from 600 eV to 40 keV," *Trans. Am. Nucl. Soc*. **92**, 665–666 (June 2005).

G. Arbanas, L. C. Leal, and N. M. Larson, "Impact of Missing Resonances in Determining Group Cross Sections and Uncertainties," *Trans. Am. Nucl. Soc*. **92**, 672–673 (June 2005).

C. S. Melhus, M. S. Rivard, B. L. Kirk, and L. C. Leal, "Clinical Brachytherapy Dosimetry Parameters and Mixed-Field Dosimetry for a High Rate CF-252 Brachytherapy Source," in *Proceedings of The Monte Carlo 2005 Topical Meeting, The Monte Carlo Method: Versatility Unbounded in a Dynamic Computing World*, Chattanooga, Tennessee, April 17–21, 2005; on CD-ROM, American Nuclear Society, LaGrange Park, Illinois (2005).

C. S. Melhus, M. S. Rivard, B. L. Kirk, and L. C. Leal, "Storage Safe Shielding Assessment for a HDR Californium-252 Brachytherapy Source," usr-cmelhus-1-paper.pdf in *Proceedings of The Monte Carlo 2005 Topical Meeting, The Monte Carlo Method: Versatility Unbounded in a Dynamic Computing World*, Chattanooga, Tennessee, April 17–21, 2005; on CD-ROM, American Nuclear Society, LaGrange Park, Illinois (2005).

L. C. Leal and H. Derrien, "Statistical Properties of the s- and p-Wave Resonances for ^{238}U," *Trans. Am. Nucl. Soc*. **91**, 566–567 (November 2004).

K. H. Guber, L. C. Leal, R. O. Sayer, P. E. Koehler, T. E. Valentine, H. Derrien, and J. A. Harvey, "New Neutron Cross-Section Measurements at ORELA and Their Application in Nuclear Criticality Calculations," presented at the 18th International Conference on the Application of Accelerators in Research and Industry (CAARI), October 10-15, 2004, Ft. Worth, Texas.

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K. Volev, N. Koyumdjieva, A. Brusegan, A. Borella, P. Siegler, N. Janeva, A. Lukyanov, L. Leal, and P. Schillebeechx, "Evaluation of the ^{232}Th Neutron Cross Sections between 4 keV and 140 keV," pp. 87–90, Vol. 769 in *Proceedings of the International Conference on Nuclear Data for Science and Technology*, Santa Fe, New Mexico, September 26–October 1, 2004.

L. C. Leal, H. Derrien, K. H. Guber, R. O. Sayer, and N. M. Larson, "Recent Cross-Section Evaluations in the Resonance Region at the Oak Ridge National Laboratory," pp. 332–337, Vol. 769 in *Proceedings of the International Conference on Nuclear Data for Science and Technology*, Santa Fe, New Mexico, September 26–October 1, 2004.

L. C. Leal, N. M. Larson, H. Derrien, T. Kawano, and M. B. Chadwick, "A New Approach for Nuclear Data Covariance and Sensitivity Generation," pp. 338–341, Vol. 769 in *Proceedings of the International Conference on Nuclear Data for Science and Technology*, Santa Fe, New Mexico, September 26–October 1, 2004.

K. H. Guber, L. C. Leal, R. O. Sayer, P. E. Koehler, T. E. Valentine, H. Derrien, and J. A. Harvey, "New Neutron Cross-Section Measurements at ORELA for Improved Nuclear Data Calculations," pp. 1706–1711, Vol. 769 in *Proceedings of the International Conference on Nuclear Data for Science and Technology*, Santa Fe, New Mexico, September 26–October 1, 2004.

H. Derrien, A. Courcelle, L. C. Leal, N. M. Larson, and A. Santamarina, "Evaluation of ^{238}U Resonance Parameters from 0 to 20 keV," pp. 276–281, Vol. 769 in *Proceedings of the International Conference on Nuclear Data for Science and Technology*, Santa Fe, New Mexico, September 26–October 1, 2004.

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K. H. Guber, L. C. Leal, R. O. Sayer, P. E. Koehler, T. E. Valentine, H. Derrien and J. A. Harvey, "Neutron Cross-Sections Measurements at ORELA for Improved Nuclear Data and their Application," in *Proceedings of ICRS-10 RPS 2004: 21st Century Challenges in Radiation Protection and Shielding*, Funchal, Madeira Island, Portugal, May 9–14, 2004.

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