Ran Hong

Curriculum Vitae

Argonne National Laboratory
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Current position

2016–now **Postdoctoral research associate**, *Argonne National Laboratory*, Argonne, USA.
Research project: Muon g-2 (E989)

Education

2010–2016 **Ph.D.**, *University of Washington*, Seattle, USA.
Major: Physics

2009–2010 **M.S.**, *University of Washington*, Seattle, USA.
Major: Physics

2005–2009 **B.S.**, *Shanghai JiaoTong University*, Shanghai, China.
Major: Applied Physics

Ph.D. thesis

Title *Developments for a measurement of the $\beta - \nu$ correlation and determination of the recoil charge-state distribution in ^{6}He β decay*

Supervisor Alejandro Garcia

Other Research Experience

Nov 2013 **ALCAP experiment**, Paul Scherrer Institute, Switzerland.
The ALCAP experiment measures the energy spectrum and yield of emitted charged-particles following muon capture on aluminum. The result will be used for designing tracking detectors of Mu2e and COMET experiments, which search for charged-lepton flavor violation. I participated in the apparatus construction and data taking.

2011-2012 **UCNA experiment**, *LANL*, USA.
The UCNA experiment measures the correlation between a neutron's spin and its decay electron's momentum. I measured the thickness of the calibration sources, which is an important factor in the energy calibration of the detectors.

2011 **Precision measurement of the ^{6}He half-life** , *CENPA*, USA.
We performed a new measurement of the ^{6}He half-life with a precision of 0.03%. It resolved the discrepancies of the previous experiments, and provided a better reference for theoretical nuclear structure studies.

Awards

2011 **Sebastian Karrer Prize in Physics**.

Teaching experience

2009-2010 **Teaching assistant**, *Department of Physics*, University of Washington.
Leading tutorial sessions for courses PHYS 121,122 and 123

2014-2015 **Contract tutor**, *WholeRen Education LLC*.
One-on-one tutoring in undergraduate level math courses (124,125,126,308) and physics courses (121,122,123,225,322)

Professional skills and languages

- **Experimental nuclear physics:**
  - Radiation detection: Proficient in designing and building multi-wire proportional chambers and scintillation detectors with photo-multiplier. Familiar with silicon detector, germanium detector, channeltron, and micro-channel plate operations.
  - Electronic design: Familiar with designing charge-sensitive preamplifiers.
  - Data acquisition: Familiar with FASTER interface, VME interface with MIDAS, and CAMAC interface with CC32.
  - Familiar with TANDEM Van de Graaff accelerator operation.
- **Software development:**
  - Proficient in C++ programming (in Unix environment)
  - Proficient in ROOT data analysis framework and GEANT4 simulation framework
  - Familiar with LABVIEW
- **Languages:** English, Chinese

Publication List

September 20, 2016

Papers and conference proceedings

[1] Ran Hong, Matthew G Sternberg, and Alejandro García. Helicity and nuclear β decay correlations. *Accepted by American Journal of Physics, preprint arXiv:1604.07913*, 2016.

[2] R. Hong, A. Leredde, Y. Bagdasarova, X. Fléchard, A. García, P. Müller, A. Knecht, E. Liénard, M. Kossin, M.G. Sternberg, H.E. Swanson, and D.W. Zumwalt. High accuracy position response calibration method for a micro-channel plate ion detector. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 835:42 – 50, 2016.

[3] F Wauters, A García, and R Hong. Erratum: Limits on tensor-type weak currents from nuclear and neutron β decays [Phys. Rev. C 89, 025501 (2014)]. *Physical Review C*, 91(4):049904, 2015.

[4] A Leredde, Y Bagdasarova, K Bailey, X Fléchard, A Knecht, A García, R Hong, E Liénard, P Müller, O Naviliat-Cuncic, et al. Laser trapped 6He as a probe of the weak interaction and a test of the sudden approximation. *Journal of Physics: Conference Series*, 635(5):52066–52066, 2015.

[5] F. Wauters, A. García, and R. Hong. Limits on tensor-type weak currents from nuclear and neutron decays. *Physical Review C*, 89(2), 2014.

[6] M.P. Mendenhall, R.W. Pattie, Y. Bagdasarova, D.B. Berguno, L.J. Broussard, R. Carr, S. Currie, X. Ding, B.W. Filippone, A. García, P. Geltenbort, K.P. Hickerson, J. Hoagland, A.T. Holley, R. Hong, T.M. Ito, A. Knecht, C.-Y. Liu, J.L. Liu, M. Makela, R.R. Mammei, J.W. Martin, D. Melconian, S.D. Moore, C.L. Morris, A. Pérez Galván, R. Picker, M.L. Pitt, B. Plaster, J.C. Ramsey, R. Rios, A. Saunders, S.J. Seestrom, E.I. Sharapov, W.E. Sondheim, E. Tatar, R.B. Vogelaar, B. Vorndick, C. Wrede, A.R. Young, and B.A. Zeck. Precision measurement of the neutron β-decay asymmetry. *Physical Review C*, 87(3), 2013.

[7] A. Knecht, Z.T. Alexander, Y. Bagdasarova, T.M. Cope, B.G. Delbridge, X. Fléchard, A. García, R. Hong, E. Liénard, P. Mueller, O. Naviliat-Cuncic, A.S.C. Palmer, R.G.H. Robertson, D.W. Storm, H.E. Swanson, S. Utsuno, F. Wauters, W. Williams, C. Wrede,

and D.W. Zumwalt. Weak interaction studies with ^{6}He. volume 1560, pages 636–640. AIP Conference Proceedings, 2013.

[8] A. Knecht, R. Hong, D.W. Zumwalt, B.G. Delbridge, A. García, P. Müller, H.E. Swanson, I.S. Towner, S. Utsuno, W. Williams, and C. Wrede. Precision measurement of the ^{6}He half-life and the weak axial current in nuclei. *Physical Review C*, 86(3), 2012.

[9] A. Knecht, R. Hong, D.W. Zumwalt, B.G. Delbridge, A. García, P. Müller, H.E. Swanson, I.S. Towner, S. Utsuno, W. Williams, and C. Wrede. Precision measurement of the ^{6}He half-life and the weak axial current in nuclei. *Physical Review Letters*, 108(12), 2012.

[10] A. Knecht, D.W. Zumwalt, B.G. Delbridge, A. García, G.C. Harper, R. Hong, P. Müller, A.S.C. Palmer, R.G.H. Robertson, H.E. Swanson, S. Utsuno, D.I. Will, W. Williams, and C. Wrede. A high-intensity source of ^{6}He atoms for fundamental research. *Nuclear Instruments and Methods in Physics Research, Section A*, 660(1):43–47, 2011.

[11] S. Yang, H. Zheng, R. Hong, S.-Y. Zhu, and M.S. Zubairy. Control of the Lamb shift by a driving field. *Physical Review A*, 81(5), 2010.

Pre-print Publications

[12] R. Hong *et. al.* A position sensitive β detector for a precision measurement of the $\beta-\nu$ angular correlation in ^{6}He decay. *In preparation*, 2016.

[13] R. Hong *et. al.* Measurement of the electron shake-off in the β-decay of laser-trapped ^{6}He atoms. *In preparation*, 2016.

PhD Thesis

[14] Ran Hong. *Developments for a measurement of the $\beta-\nu$ correlation and determination of the recoil charge state distribution in ^{6}He β decay.* PhD thesis, University of Washington, 2016.

Invited Talks

[15] Measurement of the electron shake-off in the β decay of laser-trapped ^{6}He atoms. Young Scientist Symposium Series. Argonne National Laboratory, High-energy Physics Division, 5 2016.

[16] High-precision measurement of the $\beta-\nu$ correlation in the ^{6}He decay. Argonne National Laboratory, High-energy Physics Division, 2015.

[17] High-precision measurement of the $\beta-\nu$ correlation in the ^{6}He decay. Fermi National Accelerator Laboratory, 2015.

[18] High-precision measurement of the $\beta-\nu$ correlation in the ^{6}He decay. Argonne National Laboratory, Physics Division, 2015.

Contributed Talks and Posters

[19] Measurement of the electron shake-off in the β decay of laser-trapped ^{6}He atoms. APS April Meeting, 2016.

[20] Searching for Tensor Current in ^{6}He beta-Decay. 15th Meeting of the Northwest Section of the APS, 2014.

[21] Development of a Position Sensitive Beta and Recoil Ion Detectors for the ^{6}He $\beta-\nu$ Angular Correlation Measurement. Fall Meeting of the APS Division of Nuclear Physics, 2014.

[22] Detector calibrations and systematic uncertainties of the precision measurement of beta-neutrino angular correlation coefficient in ^{6}He decay. Fall Meeting of the APS Division of Nuclear Physics, 2013.

[23] High precision determina1on of ^{6}He half-life. 13th Meeting of the Northwest Section of the APS, 2011.