

Yajing Liu

Department of Geology and Geophysics
Clark South 285, MS#24
Woods Hole Oceanographic Institution
Woods Hole, MA 02543, USA

Tel: (508)-289-2769
E-mail: yliu@whoi.edu
Web: <http://www.whoi.edu/profile/yliu/>

Education

2007 Ph.D. (Geophysics), Harvard University, Cambridge, Massachusetts, U.S.A.

Thesis: Physical basis of aseismic deformation transients in subduction zones

2001 Sc. B. (Geophysics), Peking University, Beijing, China

Thesis: Finite element method simulation on stress state in subduction zone and mechanism of deep earthquakes

Employment

2009/08 – present Assistant Scientist, Department of Geology and Geophysics,
Woods Hole Oceanographic Institution

2007/08 – 2009/08 Harry Hess Postdoctoral Research Fellow, Department of Geosciences,
Princeton University

Research Experience

Assistant Scientist Department of Department of Geology and Geophysics, Woods Hole
(2009/08 – present) Oceanographic Institution

- Mechanism of non-volcanic tremors on plate boundaries
- Up-dip and down-dip limits of mega-thrust earthquake rupture

Postdoctoral Department of Geosciences, Princeton University
Research Research advisor: Professor Allan M. Rubin

- (2007/08 – 2009/08)
- Pore fluid pressure coupling with frictional strength and slip
 - Rate and state friction properties of rocks from different tectonic settings
 - Precise microearthquake relocation

Doctoral Research Department of Earth and Planetary Sciences, Harvard University
(2001/09 – 2007/06) Research advisor: Professor James R. Rice

- Numerical simulation of fault loading processes and crustal deformation in earthquake cycles
- Physical mechanism of aseismic deformation transients and associated non-volcanic tremors, relation to nearby seismicity

Undergraduate Department of Geophysics, Peking University
Research Research advisor: Professor Jieyuan Ning

- (2000/09 – 2001/06)
- Deep subduction earthquake mechanism

Teaching Experience

Co-instructor

MIT/WHOI 12.752: Seminar in oceanic faulting and earthquakes, Fall 2009

Teaching Fellow for three Harvard undergraduate and graduate level courses:

Applied Math 21a: Mathematical methods in the sciences, Fall 2002

Applied Math 105b: Ordinary and partial differential equations, Spring 2004
Applied Math 205: Practical scientific computing, Fall 2004

Professional Societies and Service

Member: American Geophysical Union, 2001 – present
Southern California Earthquake Center, 2003 – present
Session chair: 2003 American Geophysical Union Fall Meeting
2006 Western Pacific Geophysics Meeting
Manuscript reviewer: Earth, Planets and Space; Earth and Planetary Science Letters;
Geophysical Journal International; Geophysical Research Letter;
Journal of Geophysical Research; Nature (Geoscience)

Honors and Awards

Harry Hess Postdoctoral Fellowship, Department of Geosciences, Princeton University, 2007-2009
Honorable mention recipient, MARGINS Outstanding Student Presentation at American Geophysical Union Fall Meeting, 2003
Canon Scholarship, Peking University, 2000

Publications

1. Liu, Y., and J. R. Rice, "Slow slip prediction based on gabbro friction data compared to GPS measurements in northern Cascadia", in press, *J. Geophys. Res.*.
2. Liu, Y., J. R. Rice, and K. M. Larson, "Seismicity variations associated with aseismic transients in Guerrero, Mexico, 1995-2006", *Earth and Planetary Science Letters*, vol. 462, pp. 493-504, 2007.
3. Liu, Y., "Physical basis of aseismic deformation transients in subduction zones", Ph.D. thesis, Harvard University, 2007.
4. Liu, Y., and J. R. Rice, "Spontaneous and triggered aseismic deformation transients in a subduction fault model", *J. Geophys. Res.*, 112, B09404, doi:10.1029/2007JB004930, 2007.
5. Liu, Y., and J. R. Rice, "Aseismic slip transients emerge spontaneously in 3D rate and state modeling of subduction earthquake sequences", *J. Geophys. Res.*, 110, B08307, doi:10.1029/2004JB003424, 2005.
6. Liu, Y., G. Ye, X. Mao and J. Ning, "2-D viscoelastic FEM simulation on stress state in the deep part of a subducted slab", *Acta Seismologica Sinica*, 15(3): 301-308, 2002.
7. Mao, X., Y. Liu, G. Ye and J. Ning, "2-D elastic FEM simulation on stress state in the deep part of a subducted slab", *Acta Seismologica Sinica*, 15(3):294-300, 2002.

Recent Invited Presentations

1. "Seismic rupture and aseismic deformation processes in subduction zones", MARGINS workshop: *The next decade of the seismogenic zone experiment*, Mt Hood, Oregon, September 2008.
2. "Aseismic deformation transients in subduction zones – what physical basis?", Lamont-Doherty Earth Observatory, Columbia University, March 2008.
3. "Studies on the physical origin of aseismic deformation transients in the framework of rate and state friction", EarthScope workshop: *Aseismic slip, non-volcanic tremor and earthquakes*, Sidney, British Columbia, Canada, February, 2008.

4. “Physical processes underlying transients – what can we learn from rate and state friction?”, Caltech Seismo-Lab seminar, Stanford Geophysics Department seminar, Princeton Solid Earth Brownbag seminar, February, 2007.

Selected Meeting Abstracts

1. Liu, Y., A. M. Rubin, J. R. Rice, and P. Segall, “Role of fault dilatancy in subduction zone aseismic deformation transients and thrust earthquakes”, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract S34B-04, 2008.
2. Rice, J. R., and Y. Liu, “Slow slip predictions based on gabbro dehydration and friction data compared to GPS measurements in northern Cascadia”, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract U32A-07, 2008.
3. Liu, Y., J. R. Rice, and N. L. DeDontney, “Explaining postseismic and aseismic transient deformation in subduction zones with rate and state friction modeling constrained by lab and geodetic observations”, *EOS Trans. AGU*, 88(52), Fall Meet. Suppl., T21A-0375, 2007.
4. Liu, Y., J. R. Rice, and K. M. Larson, “Seismicity variations associated with aseismic transients: Guerrero, Mexico, 1995-2006”, *Eos Trans. AGU*, 88(23), Jt. Assem. Suppl., Abstract G33A-06, 2007.
5. Liu, Y., and J. R. Rice, “Physical processes underlying aseismic deformation transients – what can we learn from the rate and state friction?”, *EOS Trans. AGU*, 87(36), West. Pac. Geophys. Meet. Suppl., Abstract T14B-02, 2006.
6. Liu, Y., and J. R. Rice, “Pore pressure evolution in shallow subduction earthquake sequences and effects on aseismic slip transients – Numerical modeling with rate and state friction”, *EOS Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract T11E-05, 2005.
7. Liu, Y., and J. R. Rice, “Modeling of subduction zone slow/silent slip events in deeper parts of the seismogenic zone”, *EOS Trans. AGU*, 85(17), Jt. Assem. Suppl., Abstract G23A-03, 2004.
8. Liu, Y., and J. R. Rice, “3-D numerical modeling of rupture sequences of large shallow subduction earthquakes”, *EOS Trans. AGU*, 84(46), Fall Meet. Suppl., Abstract T42C-07, 2003.