Peggy A. Johnson

Education

University of California, Berkeley, Ph.D. Candidate, Degree expected Fall 1997.

Dissertation: Earthquake Source Processes (M 0 -5) along the San Andreas Fault at Parkfield and along the Hayward fault in the East San Francisco Bay Area

Dissertation Committee: Douglas S. Dreger, Lane R. Johnson, Peter E. Malin, H. Frank Morrison

M.S. in Geophysics, 1989, University of Washington, Seattle

Thesis: Cluster Analysis of Eastern Washington Seismicity

Adviser: Stephen S. Malone

B.S. in Geology with Honors, 1985, California State University, Sacramento

Thesis: The Durrwood Meadows, California Earthquake Swarm of 1983-1984

Adviser: Susan Slaymaker

Research Interests

Earthquake source processes, focussing on the smallest events possible (M < 3) to investigate a possible break in scaling representing a transition to fresh rock fracture and also to investigate rupture initiation

Empirical Green's function deconvolution

Seismotectonics along the central San Andreas fault and in the San Francisco Bay Area

Cluster analysis for source deconvolution, site response analysis, and high-resolution seismotectonic studies

Anomalous moment tensors: non-double couple mechanisms indicative of classical wing cracks (of fracture mechanics) in the crust or of hydrofracturing

Observational seismology.

Positions Held

1992 - Present, Graduate Research Assistant, *University of California, Berkeley and LBNL*

Studying the structure and rupture processes of the fault zone at Parkfield; involved with the planning and installation of a 24 bit wide dynamic range, high gain network along the Hayward fault.

1988 - 1991, Graduate Research Assistant, *University of Nevada, Reno*

Fracture mechanics and faulting; earthquake source mechanics; experimental modeling of the stick-slip mechanism of earthquakes, including the design and construction of a large loading apparatus. Analysis of the Nevada State seismic network data. Work with PC, Macintosh, VAX/VMS, and SUN computer systems.

1985 - 1988, Graduate Research Assistant, *University of Washington, Seattle*

High-precision relative relocation of earthquakes; waveform analysis; collection and analysis of local and regional seismic data, including portable data; cluster analysis of eastern Washington seismicity. Experience with seismic network operations, running portable networks, and maintaining and repairing permanent seismic and telemetry equipment.

1984 - 1985, Assistant Geophysicist, *Union Oil, Santa Rosa, California*

Responsible for the design of a new seismic data management system, for the daily operation of the seismic data collection on a Sprengnether Q-Log, and the location and cataloging of earthquakes. Design and execution of research projects. Field work with seismic stations.

1983 - 1984, Assistant Researcher, *California Division of Mines and Geology, Sacramento, California*

Volunteer and salaried work. Mammoth Lakes seismic data reduction. Involved with other seismic DOE geothermal projects. Use of various computers.

1983 Summer, Assistant Geophysicist, *Union Oil, Santa Rosa, California*

As in 1984-1985. Responsible for the design of a new seismic data management system, for the daily operation of the seismic data collection on a Sprengnether Q-Log, and the location and cataloging of earthquakes. Design and execution of research projects. Field work with seismic stations.

Memberships in Professional Societies

American Geophysical Union
Seismological Society of America
American Association for the Advancement of Science

Publications

Johnson, P.A., to be filed 1997. Earthquake Source Processes (M 0 -5) along the San Andreas Fault at Parkfield and along the Hayward fault in the East San Francisco Bay Area, *Ph.D. Dissertation, University of California, Berkeley.*

Johnson, P.A. and D.S. Dreger, 1997. Earthquake source process times of M 1 to 5 Parkfield earthquakes from empirical Green's function deconvolution, submitted to *J. Geophys. Res.*

Johnson, P.A., 1997. Seismotectonics at Parkfield: The four M 4.4 - 5.0 earthquake sequences of 1992-1994, to be submitted to *Bull. Seism. Soc. Am.* October 1997.

Weber-Band, J., P.A. Johnson, and D. Jones, 1997. Active tectonic deformation at the eastern margin of the Californai Coast ranges: Results of the BASIX and Calcrust programs, *Tectonics* (accepted).

Johnson, P.A. and T.V. McEvilly, 1995. Parkfield seismicity: Fluid-driven? *J. Geophys. Res.* **100,** 12,937-12950.

Johnson, P.A. and T.V. McEvilly, 1994. Fluids and faulting: Suggestive evidence and crucial tests at Parkfield, in *Proceedings of Workshop LXIII: The Mechanical Involvement of Fluids in Fauling* , U.S.G.S. Open-File Report **94-228,** 39-71.

Nadeau, R., M. Antolik, P. Johnson, W. Foxall and T.V. McEvilly, 1994. Seismological studies at Parkfield III: Microearthquake clusters in the study of fault-zone dynamics, *Bull. Seism. Soc. Am.* **83,** 247-263.

dePolo, C.M., W.A. Peppin and P.A. Johnson, 1993. Contemporary tectonics, seismicity, and potential earthquake sources in the White Mountains seismic gap, west-central Nevada and east-central California, USA, *Tectonophysics* **225,** 271-299.

Brune, J.N., S. Brown and P.A. Johnson, 1993. Rupture mechanism and interface separation in foam rubber models of earthquakes: A possible solution to the heat flow paradox and the paradox of large overthrusts, *Tectonophysics* **218,** 59-67.

Brune, J.N., P.A. Johnson and C. Slater, 1990. Nucleation, predictability, and rupture mechanism in foam rubber models of earthquakes, *J. Himalayan Geology* **1(2),** 155-166.

Johnson, P.A., 1989. Central Washington seismicity: Evidence for a reactivated buried continental rift and northwest-trending structural zones, *Geophys. Res. Lett.,* **16,** 1325-1328.

Johnson, P.A., 1989. Cluster analysis of eastern Washington seismicity, *M.S. Thesis, University of Washington, Seattle,* 86 p.

Zollweg, J.E. and P.A. Johnson, 1989. The Darrington seismic zone in northwestern Washington, *Bull. Seis. Soc. Am.,* **79,** 1833-1845.

Presentations

Johnson, P.A. and D. Dreger, 1997. Importance of Directivity in the Estimation of Earthquake Source Parameters at Parkfield (abstr.) *EOS Trans. Am. Geophys. Un.,* , submitted.

Johnson, P.A. and D. Dreger, 1997. Parkfield and Hayward Fault Earthquake Source Process Times Determined by Empirical Green's Function Deconvolution: Time and Frequency Domain Interpretations (abstr.), *International Association of Seismology and Physics of the Earth's Interior (IASPEI) 29th General Assembly,* Thessaloniki, Greece, August 1997.

Johnson, P.A. and D. Dreger, 1997. Empirical Green's Function Deconvolution of Parkfield and Hayward Fault Earthquakes (abstr.), *Incorporated Research Institutes for Seismology (IRIS),* June 1997, Breckinridge, CO.

Johnson, P.A. and L.R. Johnson, 1996. Moments, magnitudes, and source properties of Parkfield earthquakes (abstr.), *EOS Trans. Am. Geophys. Un.,* **77(46),** 505.

Johnson, Peggy A. and T.V. McEvilly, 1995. Seismicity of the Hayward Fault (abstr.), *Am. Assoc. Petr. Geol. Bull.* **79(4),** 589.

Johnson, P.A. and T.V. McEvilly, 1995. Seismic fault zone slip at Parkfield, 1992-1995 (abstr.), *EOS, Trans. Am. Geophys. Un. (Suppl.),* **76(46),** 430.

Johnson, P.A. and T.V. McEvilly, 1995. Source characteristics of the three recent M4.7-5.0 sequences in the Parkfield nucleation zone (abstr.), *Seism. Res. Lett.* **66(2),** 36.

Johnson, P.A., L.R. Johnson, J. Peterson and T.V. McEvilly, 1994. Body-wave moment tensor inversion of Parkfield borehole data (abstr.), *EOS, Trans. Am. Geophys. Un. (Suppl.),* **75(44),** 435.

Johnson, P.A. and T.V. McEvilly, 1993. Wideband, high dynamic range, borehole networks; a window with a grand view into earthquake scaling (abstr.), *EOS, Trans. Am. Geophys. Un. (Suppl.),* **74(43),** 406.

Johnson, P.A. and T.V. McEvilly, 1993. The Hayward Fault surveillance system; a modern high-resolution borehole network for monitoring an active fault zone (abstr.) *Seism. Res. Lett.* **64(1),** 42.

Johnson, P.A., M. Antolik, W.A. Peppin, W. Foxall, and T.V. McEvilly, 1992. Structure and rupture processes of the fault zone at Parkfield from the spectra of microearthquakes (abstr.), *Seis. Res. Lett.,* **63,** 75.

Johnson, P.A., S. Wesnousky, and K. Shimazaki, 1991. Fault complexity, seismic productivity and the shape of the b-value curve as a function of geologic offset (abstr.), *EOS Trans. Am. Geophys. Un.,* **72,** 999.

Ellis, Mike, William A. Peppin, and Peggy A. Johnson, 1991. Spatial variations in cumulative strain between 1969-89 along the Loma Prieta Section of the San Andreas Fault (abstr.), *Seis. Res. Lett.,* **62(1),** 29.

Brune, J.N., S. Brown and P.A. Johnson, 1991. Stick-slip mechanisms in foam rubber model earthquakes and the heat flow problem (abstr.), *EOS Trans. Am. Geophys. Un.,* **72,** 999.

Johnson, P.A. and S.D. Malone, 1991. Cluster Analysis of eastern Washington seismicity: A new algorithm, results and geologic correlations (abstr.), *Seis. Res. Lett.,* **62,** 47.

Ellis, M., W.A. Peppin and P.A. Johnson, 1991. Spatial variations in cumulative strain between 1969-89 along the Loma Prieta section of the San Andreas fault (abstr.), *Seis. Res. Lett.,* **62,** 29.

Johnson, P.A., dePolo, C.M. and W.A. Peppin, 1990. The M 4.6 Fish Lake Valley, Nevada earthquake 15 January 1990 and the White Mountains seismic gap (abstr.), *Seis. Res. Lett.,* **61,** 41.

Brune, J.N., P.A. Johnson and C. Slater, 1989. Constitutive relations for foam rubber stick-slip (abstr.), *Seis. Res. Lett.,* **60**, 26.

Johnson, P.A., 1989. Seismic evidence for reactivated Eocene grabens in central Washington (abstr.), *EOS Trans. Am. Geophys. Un.,* **70**, 466.

Brune, J.N., P.A. Johnson and C. Sclater, 1989. Constitutive relations for foam rubber stick-slip (abstr.), *Seis. Res. Lett.,* **60(1),** 26.

Johnson, P.A. and J.E. Zollweg, 1987. High precision relative locations for a northwestern Washington earthquake swarm (abstr.), *Seis. Res. Lett.,* **58,** 28.

Johnson, P.A. and J.E. Zollweg, 1987. The 1986 Darrington, Washington earthquake swarm: evidence for tightly clustered asperities? (abstr.), *EOS Trans. AGU.,* **68,** 46.

Johnson, P.A., 1987, Earthquake sequence analysis, in *Annual Technical Report on Earthquake Monitoring of Eastern Washington, University of Washington,* 44-53.

Johnson, P.A., 1986. Swarm relocation technique, in *Annual Technical Report on Earthquake Monitoring of Eastern Washington, University of Washington*, 30-36.

Johnson, P.A., 1985. The Vantage earthquake swarm, in *Annual Technical Report on Earthquake Monitoring of Eastern Washington, University of Washington*, 46-49.

Cramer, C., C. Real, S. Naramore, and P. Johnson, 1983. Selected earthquake swarms near Mammoth Lakes, Mono Co., CA 1980-1982 and their relationship to local seismicity and tectonics (abstr.), *EOS Trans. Am. Geophys. Un.,* **63,** 1029-1030.