Daniel Bowden

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EDUCATION

Ph.D. Candidate, Geophysics
California Institute of Technology, Pasadena, CA
2012-2017 (expected)
Advisor: Victor Tsai

Bachelors of Science, Physics
University of California, San Diego, La Jolla, CA
2006-2010

RESEARCH SUMMARY

Ambient Noise Imaging: In addition to traditional velocity tomography, signals extracted through ambient noise cross correlation can be used to provide direct observation of amplification site effects. Careful signal processing and wavefront imaging are required for robust measurements where amplitudes are concerned.

Surface Wave Site Effects: Energy conservation of a passing surface wave allows us to analytically estimate amplification factors for an arbitrary velocity structure. Surprisingly, these amplification site terms are different than for the vertically incident shear wave usually considered in hazard analysis.

Crustal Tectonics, Offshore Southern California: Tomography using the ALBACORE array of Ocean Bottom Seismometers offshore southern California reveals more about the tectonic history, to supplement the well document on-land extent of shear associated with the plate boundary.

3D Array Processing: A novel 3D deployment of instruments in the Homestake Mine in South Dakota allows for the development of new techniques relating to noise observations, beamforming, wavefront propagation and the characterization of shallow crustal heterogeneity.

PUBLICATIONS

Bowden, D. C., and V. C. Tsai (2017), “Earthquake ground motion amplification for surface waves” Geophys. Res. Lett., 44, 121-127,doi:10.1002/2016GL071885.

Bowden, D. C., M. D. Kohler, V. C. Tsai, and D. S. Weeraratne (2016). "Offshore Southern California lithospheric velocity structure from noise cross-correlation functions" J. Geophys. Res., 121, doi:10.1002/2016JB012919.

Bowden, D. C., V. C. Tsai, and F.-C. Lin (2015). "Site amplification, attenuation and scattering from noise correlation amplitudes across a dense array in Long Beach, CA" Geophys. Res. Lett., 42, 1360-1367, doi:10.1002/2014GL062662.

Earle, P. S., D. C. Bowden, M. Guy (2011). "Twitter earthquake detection: earthquake monitoring in a social world" Annals of Geophysics, 54, 6, 708-715, doi:10.4401/ag-5364

POSITIONS

Sep 2012 - Present: Graduate Research Assistant, Caltech, Pasadena, CA
Mar 2011 - Aug 2012: Seismology Intern / Contractor, USGS NEIC, Golden, CO
Jun - Aug 2010: IRIS Intern at Stanford and USGS, Menlo Park, CA

TEACHING EXPERIENCE

2016 & 2017 T.A., Seismology, Graduate Level
2014 & 2015 T.A., Field Geophysics, Graduate Level
2006 - 2010 UCSD Wilderness Instructor (Backpacking, Kayaking, etc.)

AWARDS

AGU Outstanding Student Paper Award, Dec 2014

INVITED TALKS

UCLA Geophysics Department Seminar, April 2016
IRIS Minority Recruitment Seminar, University of New Mexico, Feb 2015
IRIS Minority Recruitment Seminar, Univ. of Houston, Clear Lake, Jan 2015

SERVICE

Journal peer reviewer for:
Earth and Planetary Science Letters
Journal of Geophysical Research: Solid Earth
Geophysical Journal International

Maintain and manage department repository of various geophysical datasets, developed scripts to aid new students with access and visualization.

Organized and coordinated weekly department seminars for one year.

FIELD EXPERIENCE

Homestake Mine Underground Array, South Dakota, 2014-2016.
PASSCAL deployment of 14 Underground + 9 Surface stations with real time Antelope data flow. Approx. 35 days field work over 2 ½ years.

Poverty Ridge Deployment, USGS, 2011, to study topographic effects on seismic amplitudes, 8 stations. 6 days of field work.

Southern Colorado aftershock deployment, USGS, 2010, 6 portable

broadband stations.

Grizzly Valley Fault reflection profiling, USGS, 2011, 6 days.

Design and field testing of a prototype magnetic coil for in-situ calibration of magneto-telluric stations, co-located with the 6 stations of the Berkeley Seismic Network, 2010.

MISC. Wilderness First Responder Certification (80 hours), CPR/First Aid
OSHA training for both general workplace and mine safety

Last updated: Feb, 2017