

Miao Zhang

Department of Earth Sciences, Dalhousie University, Halifax, NS, B3H 4R2, Canada

Homepage: <https://sites.google.com/site/seismzhang/>

Research Interests

Microearthquake Detection and Location

Nuclear Explosion Monitoring

Volcanic Earthquake

Induced Earthquake

Education

June 2015 Ph.D. (Geophysics), University of Science and Technology of China, Hefei, China. Thesis: Earthquake Location and Detection. Supervisor: Dr. Lianxing Wen.

July 2010 B.S. (Physics), Henan Normal University, Xinxiang, China, July 2010.

Professional Experience

April 2019 (coming soon): **Assistant Professor**, Department of Earth Sciences, Dalhousie University, Halifax, NS, Canada.

March 2018-March 2019: **Postdoctoral Scholar**, Department of Geophysics, Stanford University, Stanford, USA. Supervisor: Dr. William Ellsworth.

March 2016-March 2018: **Postdoctoral Research Associate**, Geophysics Group, Los Alamos National Laboratory, Los Alamos, USA. Supervisor: Dr. Lianjie Huang.

July 2015-March 2016: **Postdoctoral Researcher**, School of Earth and Space Sciences, University of Science and Technology of China, Hefei, China. Supervisor: Dr. Lianxing Wen.

Awards and Honors

2015, Chinese Academy of Science President Award

2015, Outstanding Graduate Award, Anhui Province

2015, Outstanding Graduate Award, USTC

2013, National Scholarship for Doctoral Students

Professional Societies

American Geophysical Union (AGU)

Society of Exploration Geophysicists (SEG)

Chinese Geophysical Society (CGS)

Professional Services

Primary Convener for Seismology Session (S022: Next Generation Seismic Source Studies), AGU Fall Meeting, 2018

Chair for Session 5(D) at Stanford Geothermal Workshop, 2017

Judge for the Outstanding Student Paper Award, AGU Fall Meeting, Since 2015

Peer Reviewer for Journals:

Geophysical Research Letters, Journal of Geophysical Research, Geophysical Journal International, Seismological Research Letters, Bulletin of the Seismological Society of America, Pure and Applied Geophysics, Interpretation

Field Experience

May 2016, VSP Data Acquisition at the Raft River Geothermal Field, Idaho, USA, One Week

Peer-Reviewed Publications

In review/In prep.

1. **Zhang M.**, Ellsworth W. and Beroza G. Automatic seismic phase association. (in prep.)
2. Tang L., **Zhang M.** and Wen L. Source discrimination between Mining blasts and Earthquakes in Tianshan orogenic belt, NW China. (in prep.)

Published/In press

3. Wang K., Ellsworth W., Beroza G., Williams G., **Zhang M.**, Schroeder D. and Rubinstein J. Seismology with Dark Data: Image-Based Processing of Analog Records Using Machine Learning for the Rangely Earthquake Control Experiment. *Seismological Research Letters*. (In press)
4. Tang L., Lu Z., **Zhang M.**, Sun L. and Wen L. Induced seismicity controlled by simultaneous abrupt change of injection rate and well pressure in Hutubi Gas Field. *Journal of Geophysical Research: Solid Earth*, 123 (7): 5929-5944, 2018.
5. Wang R., Gu YJ., Schultz R., **Zhang M.** and Kim A. Source Characteristics and Geological Implications of the January 2016 Induced Earthquake Swarm near Crooked Lake, Alberta. *Geophysical Journal International*, 210 (2), 979-988, 2017.
6. Sun L., **Zhang M.** and Wen L. A new method for high-resolution event relocation and application to the aftershocks of Lushan Earthquake, China. *Journal of Geophysical Research: Solid Earth*, 121 (4), 2539-2559, 2016.
7. **Zhang M.** and Wen L. Earthquake characteristics before eruptions of Japan's Ontake volcano in 2007 and 2014. *Geophysical Research Letters*, 42 (17), 6982-6988, 2015.

8. **Zhang M.** and Wen L. Seismological Evidence for a Low - Yield Nuclear Test on 12 May 2010 in North Korea. *Seismological Research Letters*, 86 (1), 138-145, 2015. [Citations: 29]
9. **Zhang M.** and Wen L. An effective method for small event detection: match and locate (M&L). *Geophysical Journal International*, 200 (3), 1523-1537, 2015. [Citations: 37; more than 80 institutes have downloaded this package]
10. **Zhang M.**, Tian D. and Wen L. A new method for earthquake depth determination: stacking multiple-station autocorrelograms. *Geophysical Journal International*, 197 (2), 1107-1116, 2014.
11. **Zhang M.** and Wen L. High-precision location and yield of North Korea's 2013 nuclear test. *Geophysical Research Letters*, 40 (12), 2941-2946, 2013. [Citations: 60]

Conference Papers/Presentations

1. **Zhang M.**, Ellsworth W., Beroza G., Waldhauser F., Chiaraluce L., Michele M. and Segou M. Toward rapid characterization of the 2016 Central Apennines, Italy earthquake sequence: a case study. AGU Fall Meeting, 2018 (Poster).
2. Wang K., Ellsworth W., Beroza G., Williams G., **Zhang M.**, Schroeder D. and Rubinstein J. Earthquake catalog reconstruction from analog seismograms: Application to the Rangely Experiment microfilms. AGU Fall Meeting, 2018 (Oral).
3. Huang Y., Gao K., **Zhang M.**, Sabin A. and Huang L. Imaging Fracture Zones at Eleven-Mile Canyon Using Anisotropic Least-Squares Reverse-Time Migration. Geothermal Resources Council Transactions, 42, 2018 (Oral) (Full Paper).
4. Wang, K., Ellsworth, W., Beroza, G., Williams, G., **Zhang, M.**, Schroeder, D., and Rubinstein, J. L. Earthquake catalog reconstruction from analog seismograms: Application to the Rangely Experiment microfilms. SCEC Annual Meeting, 2018 (Poster).
5. **Zhang M.**, Huang L., Gao K., Huang, Y. and Sabin A. High-Resolution Seismic Imaging for Geothermal Exploration at Eleven-Mile Canyon in Nevada. Paper presented at 43rd Workshop on Geothermal Reservoir Engineering, 2018 (Oral) (Full Paper).
6. **Zhang M.**, Gao K., and Huang L. Imaging Fracture/Fault Zones at Eleven-Mile Canyon in Nevada for Geothermal Exploration Using Anisotropic Reverse-Time Migration. AGU Fall Meeting, 2017 (Oral).
7. Huang Y., **Zhang, M.** and Huang L. Ground-Roll Noise Suppression in Land Surface Seismic Data Using a Wavenumber-Adaptive Bandpass Filter. Geothermal Resources Council Transactions, 41, 1659-1668, 2017 (Oral) (Full Paper).

8. Wang R., Gu YJ. and **Zhang M.** Hydraulic Fracturing Induced Seismicity in Western Canada: Insights from Focal Mechanism and Swarm Analysis. 2017 SEG Microseismic Workshop: Technologies & Applications, 2017 (Oral) (Full Paper).
9. Wang R., Gu, YJ., Chen Y. and **Zhang M.** The January 2016 Earthquake Sequence near Fox Creek and its Relation to Hydraulic Fracturing. 2017 Canadian Geophysical Union Annual Meeting, 2017 (Oral).
10. Chen T., **Zhang M.** and Huang L. Fast detection of induced microseismicity for CO₂ injection monitoring. 2017 Carbon Capture, Utilization & Storage Conference, 2017 (Oral).
11. **Zhang M.**, Gao K., Balch R., Huang L. Monitoring CO₂ injection at the Farnsworth EOR field in Texas using joint inversion of time-lapse VSP data. 2017 Carbon Capture, Utilization & Storage Conference, 2017 (Oral).
12. Li D., Gao K., Huang Y., **Zhang M.**, Chi B., Moore J., Huang L. Subsurface Imaging of Raft River Geothermal Field Using 2010 Walkaway VSP Data. Paper presented at 42nd Workshop on Geothermal Reservoir Engineering, 2017 (Oral) (Full Paper).
13. **Zhang M.**, Gao K. and Huang L. Anisotropic Reverse-Time Migration for Imaging Fracture Zones at Eleven-Mile Canyon. Paper presented at 42nd Workshop on Geothermal Reservoir Engineering, 2017 (Oral) (Full Paper).
14. **Zhang M.**, Gao K., Balch R. and Huang L. Joint inversion of time-lapse VSP data for monitoring CO₂ injection at the Farnsworth EOR field in Texas. AGU Fall Meeting, 2016 (Poster).
15. Tang L., **Zhang M.**, Sun L. and Wen L. Injection-induced Seismicity in a Natural Gas Reservoir in Hutubi, Southern Junggar Basin, Northwest China. AGU Fall Meeting, 2015 (Poster).
16. **Zhang M.** and Wen L. Earthquake characteristics before eruptions of Japan's Ontake volcano in 2007 and 2014. AGU Fall Meeting, 2015 (Poster).
17. **Zhang M.** and Wen L. Seismicity characteristics before eruptions of Japan's Ontake volcano in 2007 and 2014. Chinese Geoscience Union Annual Meeting, 2015 (Oral). **(Invited)**
18. **Zhang M.** and Wen L. An effective method for small event detection: Match and Locate (ML). Chinese Geoscience Union Annual Meeting, 2014 (Oral).
19. **Zhang M.** and Wen L. An effective method for small event detection: Match and Locate (ML) and its applications. AGU Fall Meeting, 2014 (Poster)
20. Sun L., **Zhang M.** and Wen L. A New Method for High-precision Earthquake Relocation and Application to the Aftershocks of Lushan Earthquake, China. AGU Fall Meeting, 2013 (Poster).
21. **Zhang M.**, Tian D. and Wen L. A new method to determine earthquake depth: stacking multiple-station autocorrelogram. AGU Fall Meeting, 2013 (Poster).

- 22. Zhang M.** and Wen L. The relationship of velocity structure, slip distribution and aftershock in the hypocenter area of the 11 March 2011 Tohoku earthquake. AGU Fall Meeting, 2012 (Poster).

Invited Lectures/Talks

1. Automatic seismic detection and location, *Invited Talk in Institute for Geophysics and Planetary Physics Seminar of UC Santa Cruz*, Santa Cruz, California, USA, Jan. 18, 2019. (coming soon)
2. Microearthquake detection and location, *Invited Talk in Earth Sciences Seminar of Dalhousie University*, Halifax, Nova Scotia, Canada, May 18, 2018.
3. An effective method for small event detection and location and its recent applications, *Invited Talk in Seismology Seminar of Stanford University*, Stanford, California, USA, Oct. 25, 2017.
4. An effective method for small event detection and location and its applications, *Invited Talk in Geophysics Brown Bag Seminar of California Institute of Technology*, Pasadena, California, USA, Dec. 21, 2015.
5. The theory and usage of match and locate (M&L) package, *Invited Lecture in Training on Seismological Methods and Codes*, University of Science and Technology of China, Hefei, China, Sep. 19-20, 2015. ([News Report](#))
6. An effective method for small event detection and its application to foreshock detection of the 2011 Mw 9.0 Tohoku earthquake. *Invited Talk in China Earthquake Networks Center*, Beijing, China, Oct. 23, 2014.