Min Liu (刘敏)

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Education

Institute of Geophysics, China Earthquake Administration, Visiting student 2020.11~2021.06
Adviser: Prof. Weitao Wang

Dalhousie University, Visiting student 2019.06-2020.08
Adviser: Prof. Miao Zhang

China University of Geosciences (Beijing), Ph.D. (Geophysics) 2016.09-2021.09
Adviser: Prof. Hongyi Li

Chengdu University of Technology, B.S. (Geophysics) 2012.09~2016.06
Adviser: Prof. Chuntao Liang

Professional Experience

Dalhousie University, Ocean Frontier Institute, International Postdoctoral Fellowship 2021.11~present

Research Interests

Small earthquake detection and location
Induced earthquake
Triggered earthquake
Machine learning

Professional Societies

American Geophysical Union (AGU)
Chinese Geoscience Union (CGU)

Peer-Reviewed Publications (*corresponding author)

In review/In prep：

1. Liu M., Li L., Zhang M., Lei X., Li H., Wang W., Evidence of fluid-driven process in a four-month-long earthquake swarm near Yunlong city, Yunan province, China. (in prep.)
2. Liu M., Zhang M., Li H., Using the match-and-locate method to investigate the detailed nucleation process and mechanism of the July 2019 Mw 6.4 Ridgecrest, California earthquake. (in review)

Published：

1. Liu M., Li H., Zhang M., Wang W., Yang Y., Li L., Chang Z., Zhang H. Investigation of the 2013 Eryuan, Yunnan, China MS 5.5 Earthquake Sequence: Aftershock Migration, Seismogenic Structure and Hazard Implication. *Tectonophysics*, in press
2. Liu M., Li H., Li L., Zhang M., Wang W., Multistage nucleation of the 2021 Yangbi Ms 6.4 earthquake and its foreshocks. *Journal of Geophysical Research: Solid Earth*, 2022
3. Zhang M., Liu M., Feng T., Wang R. and Zhu W. LOC-FLOW: An End-to-End Machine-Learning-Based High-Precision Earthquake Location Workflow. *Seismological Research Letters,* 2022
4. Su J., Liu M*, Zhang Y., Wang W., Li H., High resolution earthquake catalog building for the 21 May 2021 Yangbi, Yunnan earthquake sequence using deep-learning phase picker. *Chinese J. Geophys. (in Chinese)*, 10.6038.cjg2021O0530, 2021

5. Zhang M., Liu M., Plourde A., Bao F., Wang R., Gosse J., Pushing the limit of single station: source characterization for two small earthquakes in Dartmouth, Nova Scotia, Canada. *Seismological Research Letters*, https://doi.org/10.1785/0220200297, 2021
6. Huang Y., Li H., Liu X., Zhang Y., Liu M., Guan Y., Su J., The Multiscale Structure of the Longmen Shan Central Fault Zone from Local and Teleseismic Data Recorded by Short-Period Dense Arrays, *Bulletin of the Seismological Society of America*, https://doi.org/10.1785/0120190292, 2020
7. Zhang Y., Li H., Huang Y., Liu M., Guan Y., Su J., Wang T., Shallow Structure of the Longmen Shan Fault Zone from a High-Density, Short-Period Seismic Array, *Bulletin of the Seismological Society of America*, https://doi.org/10.1785/0120190147, 2020
8. Liu M., Zhang M., Zhu W., Ellsworth W. and Li H., Rapid Characterization of the July 2019 Ridgecrest, California Earthquake Sequence from Raw Seismic Data using Machine Learning Phase Picker. *Geophysical Research Letters*, https://doi.org/10.1029/2019GL086189, 2020
9. Liu M., Li H., Zhang M. and Wang T., Graphics Processing Unit-based Match and Locate (GPU-M&L): an improved Match and Locate method and its application. *Seismological Research Letters*, https://doi.org/10.1785/0220190241, 2020
10. Liu M., Li H., Peng Z., Ouyang L., et al., Spatial-temporal distribution of early aftershocks following the 2016 Ms 6.4 Menyuan, Qinghai, China Earthquake. *Tectonophysics*, 766, 469–479. https://doi.org/10.1016/j.tecto.2019.06.022, 2019.
11. Wang T., Liu M*., Li H., Cui B., Zhong S., Relocation of the aftershock sequence and activity of the MS5.8 Alxa earthquake. *Chinese J. Geophys. (in Chinese)*, 62(6): 2038-2047, doi: 10.6038/cjg2019N0024, 2019.

Abstracts/Presentations

1. Liu M., Seismicity offshore Nova Scotia: a preliminary investigation, GAC-MAC, 2022. (Oral)
2. Liu M., High-Precision Earthquake Locations Reveal How Earthquakes Nucleate, Migrate and Their Associated Seismogenic Structures, EES Departmental Seminar, 2022. (Invited)
3. Liu M., Seismicity monitoring, Xian Seismological Bureau, 2020. (Invited)
4. Liu M., Seismicity monitoring, 1st Asia-Pacific Geophysics Student Conference, Anhui province, China, 2020. (Invited)
5. Liu M., Zhang M., Zhu W., Ellsworth W. and Li H., Rapid Characterization of the July 2019 Ridgecrest, California Earthquake Sequence from Raw Seismic Data using Machine Learning Phase Picker, CGU Annual Meeting, 2020. (Oral)
6. Liu M., Zhang M. and Li H., Detailed nucleation process and mechanism of the July 2019 Mw 6.4 Ridgecrest, California earthquake, CGU Annual Meeting, 2020. (Oral)
7. Zhang M., Liu M., Plourde A., Bao F. and Wang R., Pushing the limit of single station: source characterization for two small earthquakes in Dartmouth, Nova Scotia, Canada, AGU Fall Meeting, 2020. (Poster)
8. Liu M., Zhang M. and Li H., Detailed nucleation process and mechanism of the July 2019 Mw 6.4 Ridgecrest, California earthquake, AGU Fall Meeting, 2020. (Poster)
9. Liu M., Zhang M., Ellsworth W., Zhu W. and Li H., A first look at the seismic characteristics of the 2019 July Ridgecrest, California earthquake sequence through the lens of machine learning, AGU Fall Meeting, 2019 (Poster).
10. Liu M., Li H., Fast Matching&Locating (FML): An improved Matching and Locating technique for small earthquake detection, AGU Fall Meeting, 2018. (Poster)
11. Liu M., Li H., Fast Matching&Locating (FML): An improved Matching and Locating technique for small earthquake detection, CGU Annual Meeting, 2018. (Oral)
12. Liu M., Li H., Peng Z., The temporal and spatial distribution of aftershocks of the 2016 Qinghai Menyuan Ms 6.4 Earthquake, AOGS Annual Meeting, 2018. (Oral)

Awards and Honors

Dalhousie University, Ocean Frontier Institute, International Postdoctoral Fellowship	2021
National Scholarship for Doctoral Students.	2020
Outstanding Student, China University of Geosciences (Beijing), China.	2020
Outstanding Student Paper Award, Annual Meeting of Chinese Geoscience Union, China.	2018
Star of the August, Chengdu University of Technology, China.	2015

Open Source Software

1. LOC-FLOW: An End-to-End Machine Learning-Based High-Precision Earthquake Location Workflow https://github.com/Dal-mzhang/LOC-FLOW

2. GPU-MatchLocate1.0 – a software to quickly detect and locate small earthquakes
https://github.com/MinLiu19/GPU-MatchLocate1.0
3. FDTCC - a software to quickly build dt.cc for hypoDD, Growclust and TomoDD
https://github.com/MinLiu19/FDTCC

Expertise & Skills

Languages: Mandarin Chinese, English.
Programming: C, C#, Fortran, Matlab, Python, Shell, Perl.
Seismological Tools: SAC, GMT, ObsPy, TauP.
Seismic phase picking: PhaseNet.
Absolute seismic location: VELEST, Hypoinverse.
Relative seismic relocation: HypoDD, Growclust
Double-difference tomography: TomoDD

Field Experiences

Deployed 170 short-period seismometers in Pingtong country, Sichuan province, China. 2020.11
Deployed 100 short-period seismometers in Dujiangyan country, Sichuan province, China. 2018.10
Deployed 20 CMG-broadband seismometers in Longyan country, Fujian province, China. 2017.07

Professional Service

Technical instructor of small earthquake monitoring, Beijing Earthquake Bureau. 2017~2019