Mijian Xu, Ph.D of Seismology

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Website
Github
Google Scholar
ORCID

Employment History

2021 – 2023 **Postdoctoral Research Fellow,** School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore
Supervisor: *Ping Tong*

2017 – 2018 **Software Engineer,** Nanjing Site, CIeNET Technologies, China

2016 – 2017 **Research Assistant,** School of Earth Science and Engineering, Nanjing University, China

Education

2018 – 2021 **Ph.D, Nanjing University** in Geology.
Thesis title: *Crustal Structure and Deformation in the Eastern Tibet: Insight From Seismic Images*.

2013 – 2016 **M.Sc, Nanjing University** in Geophysics.
Thesis title: *Mantle Transition Zone Structures Beneath SE Tibet Revealed by Receiver Functions*.

Research Interests

- **Seismic Imaging and Tomography**
- **Adjoint-state Full-waveform Inversion**
- **Computational Seismology**
- **Continental Geodynamics**

Research Publications

Journal Articles

1. **Xu**, **Mijian**, Kai Wang, Jing Chen, Dayong Yu, and Ping Tong. "Receiver Function Adjoint Tomography for Three-Dimensional High-Resolution Seismic Array Imaging: Methodology and Applications in Southeastern Tibet". *Geophysical Research Letters*, vol. 50, no. 19, 2023, e2023GL104077. https://doi.org/10.1029/2023GL104077.

2. **Xu**, **Mijian**, and Jing He. "Seispy: Python Module for Batch Calculation and Postprocessing of Receiver Functions". *Seismological Research Letters*, vol. 94, 2A, Dec. 2022, pp. 935–43. https://doi.org/10.1785/0220220288.

3. He, Jing, **Mijian Xu**, Qingju Wu, and Fengxue Zhang. "Hydrous Melting Driven Upwelling From the Mantle Transition Zone in the Mongolia Plateau Revealed by Receiver Function Analysis". *Journal of Geophysical Research: Solid Earth*, vol. 127, no. 11, 2022, e2022JB024905. https://doi.org/10.1029/2022JB024905.

4. Hu, Xuzhi, **Mijian Xu**, Mingjie Xu, Yueqiao Zhang, and Zhouchuan Huang. "A relic thickened crustal root beneath the Cenozoic rift zone of the NW Ordos margin, North China, revealed by receiver functions". *Physics of the Earth and Planetary Interiors*, vol. 333, 2022, p. 106953. https://doi.org/10.1016/j.pepi.2022.106953.

5. Li, Tianjue, Jiayuan Yao, Shucheng Wu, **Mijian Xu**, and Ping Tong. "Moho Complexity in Southern California Revealed by Local PmP and Teleseismic Ps Waves". *Journal of Geophysical Research: Solid Earth*, vol. 127, no. 2, 2022, e2021JB023033. https://doi.org/10.1029/2021JB023033.

6. **Xu**, **Mijian**, Dayong Yu, Zhouchuan Huang, Ping Tong, Shijie Hao, Youyi Ruan, and Cunrui Han. "Crustal and Uppermost Mantle Heterogeneities Across the Ailaoshan Red River Shear Zone, SE Tibet: Implications for Cenozoic Magmatic Activity". *Journal of Geophysical Research: Solid Earth*, vol. 127, no. 6, 2022, e2021JB023656. https://doi.org/10.1029/2021JB023656.

7. **Xu**, **Mijian**, Zhouchuan Huang, Liangshu Wang, Mingjie Xu, Yueqiao Zhang, Ning Mi, Dayong Yu, and Xiaohui Yuan. "Sharp Lateral Moho Variations Across the SE Tibetan Margin and Their Implications for Plateau Growth". *Journal of Geophysical Research: Solid Earth*, vol. 125, no. 5, May 2020. https://doi.org/10.1029/2019JB018117.

8. Tian, Muyu, Zhouchuan Huang, Liangshu Wang, Mingjie Xu, Ning Mi, Dayong Yu, Haibo Wang, Tao Gou, **Mijian Xu**, Cunri Han, Shijie Hao, and Yajing Bi. "Tectonic evolution of the eastern margin of the Tibetan plateau: Insight from crustal structures using P wave receiver functions". *Journal of Asian Earth Sciences*, vol. 191, Apr. 2020, p. 104230. https://doi.org/10.1016/j.jseaes.2020.104230.

9. **Xu**, **Mijian**, Zhouchuan Huang, Liangshu Wang, Mingjie Xu, Ning Mi, and Dayong Yu. "Lateral variation of the mantle transition zone beneath the Tibetan Plateau: Insight into thermal processes during Indian–Asian collision". *Physics of the Earth and Planetary Interiors*, vol. 301, Apr. 2020, p. 106452. https://doi.org/10.1016/j.pepi.2020.106452.

10. Han, Cunrui, **Mijian Xu**, Zhouchuan Huang, Liangshu Wang, Mingjie Xu, Ning Mi, Dayong Yu, Tao Gou, Haibo Wang, Shijie Hao, Muyu Tian, and Yajing Bi. "Layered crustal anisotropy and deformation in the SE Tibetan plateau revealed by Markov-Chain-Monte-Carlo inversion of receiver functions". *Physics of the Earth and Planetary Interiors*, 2020, p. 106522. https://doi.org/https://doi.org/10.1016/j.pepi.2020.106522.

11. **Xu**, **Mijian**, Hui Huang, Zhouchuan Huang, Pan Wang, Liangshu Wang, Mingjie Xu, Ning Mi, Hua Li, Dayong Yu, and Xiaohui Yuan. "Insight into the subducted Indian slab and origin of the Tengchong volcano in SE Tibet from receiver function analysis". *Earth and Planetary Science Letters*, 2018. https://doi.org/10.1016/j.epsl.2017.11.048.

12. **Xu**, **Mijian**, Hui Huang, Zhouchuan Huang, and Liangshu Wang. "SplitRFLab: A MATLAB GUI toolbox for receiver function analysis based on SplitLab". *Earthquake Science*, 2016. https://doi.org/10.1007/s11589-016-0141-8.

13. Huang, Zhouchuan, Pan Wang, Mingjie Xu, Liangshu Wang, Zhifeng Ding, Yan Wu, **Mijian Xu**, Ning Mi, Dayong Yu, and Hua Li. "Mantle structure and dynamics beneath SE Tibet revealed by new seismic images". *Earth and Planetary Science Letters*, vol. 411, 2015, pp. 100–111. https://doi.org/10.1016/j.epsl.2014.11.040.

Skills

Languages	Mandarin Chinese, English.
Coding	Python, Modern Fortran, C, Perl, Matlab, PyTorch, LaTeX, …
Seismological Software	Specfem3D (Cartesian and Global versions), SAC, Obspy, GMT, Fk, CAP, …
Instruments	Reftek-130/130s data logger and Guralp CMG-40T/3T sensor, Zland 3C nodes, …
Misc.	High-performance computing, RedHat operation and maintenance, Continuous Integration, …

Miscellaneous Experience

Software

2021 – present — **FWAT** (collaborated with Kai Wang) – A full-waveform adjoint tomography package based on SPECFEM3D. (*Under development*)
The FWAT package can perform adjoint tomography of noise, teleseismic, receiver function data and their joint inversion. I joined FWAT project in 2021 and have been responsible for the development of receiver function adjoint tomography, its joint inversion with noise data, and model visualization.

2016 – present — **Seispy** – A Python module for automatic calculations of receiver function and its derivative process.
https://seispy.xumijian.me

2015 — **BQMail** – A Python module to batch send seismic data requests to IRIS DMC.
https://git.nju.edu.cn/xumi1993/bqmail2.0

2014 — **SplitRFLab** – A Matlab toolbox for computing receiver functions and shear wave splitting.
https://github.com/xumi1993/SplitRFLab

Certification

2015 — **Red Hat Certified Engineer**

Field Experience

2023 — **Geothermal survey in Singapore**, Install and maintain 80 short period nodes in Sembawang, Singapore.

2019 — **Geological survey in Huizhou**, Install 500 short period nodes and 25 broadband seismic stations across Lianhuashan Fault zone.

2018 – 2020 — **ChinArray III**, Install and maintain broadband seismic stations in Liaodong Peninsula.

2013 – 2016 — **ChinArray II**, Install and maintain broadband seismic stations in Ordos Basin.