

TIAN Dongdong 田冬冬

Professor in Geophysics

School of Geophysics and Geomatics (SGG)
China University of Geosciences (CUG)
Room 512B, Archives Building
388 Lumo Rd, Wuhan, China

✉ dtian@cug.edu.cn
☎ 0000-0001-7967-1197
🌐 me.seisman.info
🔗 [seisman](#)

Education

2018 Ph.D. in Geophysics, University of Science and Technology of China (USTC), Hefei, China
2012 B.S. in Geophysics, University of Science and Technology of China (USTC), Hefei, China

Employment

2022/12–present Professor, School of Geophysics and Geomatics, China University of Geosciences
2021/11–2022/11 Associate Professor, School of Geophysics and Geomatics, China University of Geosciences
2018/08–2021/09 Postdoctoral Research Associate, Department of Earth and Environmental Sciences, Michigan State University

Research Interests

- Structure of the Earth's Deep Interior
- Theory and Observations of Earthquake Sources
- Theory of Seismic Wave Propagation

Professional Societies & Services

Professional Societies

- Member of [American Geophysical Union \(AGU\)](#) (since 2012)
- Member of [Chinese Geophysical Society \(CGS\)](#) (since 2022)
- Member of [Seismological Society of China](#) (since 2024)

Professional Services

- Associate Editor, Earthquake Research Advances (since 2024)
- Member, Seismology Committee, Seismological Society of China (since 2024)
- Member, Committee on Study of the Earth's Deep Interior, SEDI China (since 2026)
- Member, Generic Mapping Tools (GMT) Steering Committee (since 2024)

- Peer-reviewer of scientific journals/grants: *Nature Communications*, *Journal of Geophysical Research: Solid Earth*, *Geophysical Research Letters*, *Seismological Research Letters*, *Review of Scientific Instruments*, *Journal of Open Source Software*, *Results in Geophysical Sciences*, *North China Earthquake Sciences*, *General Program and Young Scientists Fund of the National Natural Science Foundation of China*
- Founder of the [SeisMan blog](#) (2013), [GMT China Community](#) (2016) and [seismo-learn](#) (2020)
- Core developer of the [Generic Mapping Tools \(GMT\)](#) and [PyGMT](#) (since 2018)
- Research assistant and database manager for [China Seismological Reference Model](#) (2016–2018)
- Judge for the Outstanding Student Paper Award, AGU Fall Meeting (2018–2020)
- Member of the working group for [China Seismological Reference Model](#) (since 2023)

Departmental Services

- Member of the Academic Degree Evaluation Subcommittee, SGG, CUG (2023–2025)

Awards & Honors

- 2021 One Hundred Talents Program, China University of Geosciences, China
- 2018 President Award, Chinese Academy of Sciences, China
- 2018 Outstanding Graduate Student, University of Science and Technology of China, China
- 2017 Outstanding Student Paper Award, 2017 Annual Meeting of Chinese Geoscience Union, China
- 2017 National Scholarship for Doctoral Students, Ministry of Education, China

Research Funding

- Outstanding Youth Team of Central Universities, CUG, ¥50k, 2023/01–2024/12, Rank 5/6
- National Natural Science Foundation of China, No. 42274122, ¥ 560k, 2023/01–2026/12, PI
- Startup, One Hundred Talents Program, CUG, ¥ 2,000k, 2021/11–2026/12, PI

Peer-reviewed Publications

*corresponding author, #co-first author.

29. Zhang, Y.*, Wei, S. S.*, **Tian, D.**, Linkimer, L., Beck, S., Portner, D. E. (2026). Dehydration of the Pampean Flat Slab and Crustal Deformation in the Overriding Plate Revealed by Earthquake Stress Drops. *Geophysical Research Letters*, *accepted*.
28. Zhang, Z.*, Wei, S. S.*, Zhang, Y., Wang, F., **Tian, D.** (2026). Along-strike variations in sub-arc melting beneath the Alaska Peninsula revealed by P-wave attenuation. *Journal of Geophysical Research: Solid Earth*, 131(8), e2026JB033769. doi:[10.1029/2026JB033769](https://doi.org/10.1029/2026JB033769)
27. **Tian, D.***, Fröhlich, Y., Leong, W. J., Grund, M., Schlitzer, W., Jones, M., Uieda, L., Luis, J. M. F. (2026). PyGMT: Bridging Python and the Generic Mapping Tools for Geospatial Visualization and Analysis. *Geochemistry, Geophysics, Geosystems*, 27(7), e2026GC013105. doi:[10.1029/e2026GC013105](https://doi.org/10.1029/e2026GC013105)

26. Li, H., Fu, L., Liu, Y., **Tian, D.**, Sun, Y., Zhou, C., Hu, X. (2026). Using the HVSR to Study the Land-slide Media Changes in Three Gorge Reservoir Area. *Seismological Research Letters*. doi:[10.1785/0220250223](https://doi.org/10.1785/0220250223)
25. Liu, X., **Tian, D.*** (2026). Stress-drop variability in aftershocks of the 2018 Mw 7.9 Gulf of Alaska Outer-Rise Earthquake. *Seismological Research Letters*. doi:[10.1785/0220260048](https://doi.org/10.1785/0220260048)
24. Wang, Z., Wang, D.*, Wan, Z., **Tian, D.***, Peng, Y. (2026). Decomposing earthquake moment tensors using P-wave first motion: Insights into global events with significant non-double-couple components. *Geophysical Research Letters*, 53(7), e2025GL121541. doi:[10.1029/2025GL121541](https://doi.org/10.1029/2025GL121541)
23. Zhang, Y. R.*, Wei, S. S.*, Byrnes, J. S., **Tian, D.**, Wang, F., Bezada, M. (2026). 3D P-wave attenuation tomography of the Tonga-Lau subduction system with improved earthquake source parameters and a transdimensional Bayesian Markov Chain Monte Carlo approach. *Journal of Geophysical Research: Solid Earth*, 131(4), e2025JB032176. doi:[10.1029/2025JB032176](https://doi.org/10.1029/2025JB032176)
22. Li, J.*, **Tian, D.**, Chu, R. (2026). Ultralow velocity zones at the core-mantle boundary in the subduction regions consistent with the iron-rich origins revealed by ScP waveform complexities. *Geophysical Journal International*, 245(1), ggag052. doi:[10.1093/gji/ggag052](https://doi.org/10.1093/gji/ggag052)
21. Li, J.*, **Tian, D.**, Li, M., Chu, R. (2025). Small-Scale Heterogeneities in the Lowermost Mantle Near the Perm Anomaly. *Journal of Geophysical Research: Solid Earth*, 130(8), e2025JB031160. doi:[10.1029/2025JB031160](https://doi.org/10.1029/2025JB031160)
20. Li, J.*, **Tian, D.***, Li, M., Sun, D., Mao, Z., Dobrosavljevic, V. (2025). Ultralow Velocity Zones at the Core-Mantle Boundary Near the Caroline Hotspot. *Journal of Geophysical Research: Solid Earth*, 130(7), e2024JB030763. doi:[10.1029/2024JB030763](https://doi.org/10.1029/2024JB030763)
19. Li, J.*, Sun, D., **Tian, D.** (2024). Localized Ultra-Low Velocity Zone as a Strong Scatterer at the Core-Mantle Boundary Beneath Central America. *Journal of Geophysical Research: Solid Earth*, 129(12), e2024JB029287. doi:[10.1029/2024JB029287](https://doi.org/10.1029/2024JB029287)
18. Li, J.*, **Tian, D.**, Sun, D., Tong, P. (2024). D'' structures beneath the East China Sea resolved by P-wave slowness anomalies. *Journal of Geophysical Research: Solid Earth*, 129(11), e2024JB029584. doi:[10.1029/2024JB029584](https://doi.org/10.1029/2024JB029584)
17. **Tian, D.** (2024). HinetPy: A Python package for accessing and processing NIED Hi-net seismic data. *Journal of Open Source Software*, 9(98), 6840. doi:[10.21105/joss.06840](https://doi.org/10.21105/joss.06840)
16. Li, J.*, Zhang, B., Sun, D., **Tian, D.**, Yao, J. (2024). Detailed 3D structures of the western edge of the Pacific Large Low Velocity Province. *Journal of Geophysical Research: Solid Earth*, 129(4), e2023JB028032. doi:[10.1029/2023JB028032](https://doi.org/10.1029/2023JB028032)
15. **Tian, D.***, & Wen, L. (2023). Comment on “Inner Core Rotation Captured by Earthquake Doublets and Twin Stations” by Yang and Song. *Geophysical Research Letters*, 50(15), e2023GL103173. doi:[10.1029/2023GL103173](https://doi.org/10.1029/2023GL103173)
14. **Tian, D.***, Wei, S. S.*, Wang, W., & Wang, F. (2022). Stress drops of intermediate-depth and deep earthquakes in the Tonga slab. *Journal of Geophysical Research: Solid Earth*, 127, e2022JB025109. doi:[10.1029/2022JB025109](https://doi.org/10.1029/2022JB025109)

13. Yao, J.* , **Tian, D.**, Sun, L., & Wen, L. (2021). Comment on “Origin of temporal changes of inner-core seismic waves” by Yang and Song (2020). *Earth and Planetary Science Letters*, 553, 116640. doi:[10.1016/j.epsl.2020.116640](https://doi.org/10.1016/j.epsl.2020.116640)
12. Wei, S. S.* , Shearer, P. M., Lithgow-Bertelloni, C., Stixrude, L., & **Tian, D.** (2020). Oceanic plateau of the Hawaiian mantle plume head subducted to the uppermost lower mantle. *Science*, 370, 983–987. doi:[10.1126/science.abd0312](https://doi.org/10.1126/science.abd0312)
11. **Tian, D.*** , Lv, M., Wei, S. S., Dorfman, S. M., & Shearer, P. M. (2020). Global variations of Earth’s 520- and 560-km discontinuities. *Earth and Planetary Science Letters*, 552, 116600. doi:[10.1016/j.epsl.2020.116600](https://doi.org/10.1016/j.epsl.2020.116600)
10. Wessel, P.* , Luis, J., Uieda, L., Scharroo, R., Wobbe, F., Smith, W. H. F., & **Tian, D.** (2019). The Generic Mapping Tools Version 6. *Geochemistry, Geophysics, Geosystems*, 20(11), 5556–5564. doi:[10.1029/2019GC008515](https://doi.org/10.1029/2019GC008515)
9. Yao, J.* , **Tian, D.**, Sun, L., & Wen, L. (2019). Temporal change of seismic Earth’s inner core phases: inner core differential rotation or temporal change of inner core surface? *Journal of Geophysical Research: Solid Earth*, 124(7), 6720–6736. doi:[10.1029/2019JB017532](https://doi.org/10.1029/2019JB017532)
8. Fan, W.* , Wei, S. S., **Tian, D.**, McGuire, J. J., & Wiens, D. A. (2019). Complex and diverse rupture processes of the 2018 Mw 8.2 and Mw 7.9 Tonga-Fiji deep earthquakes. *Geophysical Research Letters*, 46(5), 2434–2448. doi:[10.1029/2018GL080997](https://doi.org/10.1029/2018GL080997)
7. Yao, J.* , **Tian, D.** , Lu, Z., Sun, L., & Wen, L. (2018). Triggered seismicity after North Korea’s 3 September 2017 nuclear test. *Seismological Research Letters*, 89(6), 2085–2093. doi:[10.1785/0220180135](https://doi.org/10.1785/0220180135)
6. Yao, J.* , **Tian, D.** , Sun, L., & Wen, L. (2018). Source characteristics of North Korea’s 3 September 2017 nuclear test. *Seismological Research Letters*, 89(6), 2078–2084. doi:[10.1785/0220180134](https://doi.org/10.1785/0220180134)
5. **Tian, D.*** , Yao, J.* , & Wen, L. (2018). Collapse and earthquake swarm after North Korea’s 3 September 2017 nuclear test. *Geophysical Research Letters*, 45(9), 3976–3983. doi:[10.1029/2018GL077649](https://doi.org/10.1029/2018GL077649)
4. Wen, L.* , **Tian, D.**, & Yao, J. (2018). Seismic structure and dynamic process of the Earth’s inner core and its boundary. *Chinese Journal of Geophysics*, 61(3), 803–818. doi:[10.6038/cjg2018L0500](https://doi.org/10.6038/cjg2018L0500) [in Chinese]
3. **Tian, D.**, & Wen, L.* (2017). Seismological evidence for a localized mushy zone at the Earth’s inner core boundary. *Nature Communications*, 8, 165. doi:[10.1038/s41467-017-00229-9](https://doi.org/10.1038/s41467-017-00229-9)
2. Chen, X.* , **Tian, D.**, & Wen, L. (2015). Microseismic sources during Hurricane Sandy. *Journal of Geophysical Research: Solid Earth*, 120(9), 6386–6403. doi:[10.1002/2015JB012282](https://doi.org/10.1002/2015JB012282)
1. Zhang, M.* , **Tian, D.**, & Wen, L. (2014). A new method for earthquake depth determination: stacking multiple-station autocorrelograms. *Geophysical Journal International*, 197(2), 1107–1116. doi:[10.1093/gji/ggu044](https://doi.org/10.1093/gji/ggu044)

Invited Presentations

2021/01/07 Nanjing University

2020/11/27 Southern University of Science and Technology

2019/02/23 Michigan State University
2018/06/15 Institute of Geology and Geophysics, Chinese Academy of Sciences
2018/06/14 Institute of Earthquake Forecasting, China Earthquake Administration
2016/09/21 Hubei Earthquake Administration
2016/06/30 China Earthquake Networks Center

Teaching Experience

Undergraduate Courses

- Continuum Mechanics (2025–2026)
- Earth Science Plotting with GMT (2025–2026)
- Undergraduate Geological Fieldwork, Zigui, Hubei (2025)
- Undergraduate Geophysics Fieldwork, Kunming and Dali, Yunnan (2026)

Workshops

- Instructor, InSAR Theory and Practice Summer Short Course: GMTSAR and Beyond (2024–2026)
- Instructor, UNAVCO Short Course “The Generic Mapping Tools for Geodesy” (2019–2022)
- Instructor, Workshop SCIWS4: “Become a Generic Mapping Tools Contributor Even If You Can’t Code”, 2019 AGU Fall Meeting (2019)

Student Supervision

Ph.D. Students

- LIU Xuan, 2022/09–
- ZHOU Xinyu, 2025/09–

M.Sc. Students

- YAN Jun, 2024/09–

Undergraduate Students

- ZHANG Xuan, 2026/09–

Former Students

- ZHAO Haoliang, 2023/09–2026/06 (M.Sc.)
- LIU Xiaoyu, 2023/09–2026/06 (M.Sc.)
- ZHOU Xinyu, 2024/09–2025/06 (B.Sc.; Outstanding Undergraduate Thesis Award)
- MAI Hongxuan, 2023/11–2024/06 (B.Sc.)
- SONG Yangqi, 2022/02–2022/06 (B.Sc.)

Field Experience

- **LEEP** (Lake Erie Earthquake exPeriment), 2018/10/12–2018/10/16, installed 8 broadband seismic stations around Lake Erie

Open Source Software

2014–present	HinetPy https://github.com/seisman/HinetPy/ A Python package to request and process seismic waveform data from Hi-net. Solo developer
2018–present	PyGMT https://pygmt.org/ A Python interface to the Generic Mapping Tools. Lead developer
2018–present	GMT https://www.generic-mapping-tools.org/ Generic Mapping Tools. Core developer