TIAN Dongdong 田冬冬

Professor in Geophysics

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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 Source
- 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, 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*, *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

Received Funds

- 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 [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

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

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

Meeting Abstracts

Oral

8. Wei, S. S., & **Tian, D.** (2022). Stress drops of small-to-moderate earthquakes beneath the Alaska Peninsula. 2022 AGU Fall Meeting, Chicago, IL, USA. ID: S42A-02.

7. Zhang, Y., Wei, S. S., Byrnes, J. S., **Tian, D.**, Wang, F., & Bezada M. (2022). P-wave attenuation structure of the Tonga subduction zone and implications for mantle wedge processes. 2022 AGU Fall Meeting, Chicago, IL, USA. ID: DI23A-06.

6. **Tian, D.** (2022). Source spectra and stress drops of small-to-moderate earthquakes beneath Tonga and the Alaska Peninsula. 2022/2021 Annual Meeting of Chinese Geosciecen Union, online.

5. Meghan, J., Grund, M., Schlitzer, W., Leong, W. J., **Tian, D.**, Yao, J., & Uieda, L. (2021). PyGMT: An open-source Python library for geospatial processing, analysis, and visualization. 2021 AGU Fall Meeting, online. ID: IN55C-08.

4. Wei, S. S., Zhang, Y., **Tian, D.**, & Wiens, D. A. (2021). New advances in body-wave attenuation studies of the Tonga subduction zone. 2021 AGU Fall Meeting, online. ID: S23B-05.

3. Wei, S. S., Shearer, P. M., Lithgow-Bertelloni, C., Stixrude, L., & **Tian, D.** (2021). Oceanic plateau of the Hawaiian mantle plume head subducted to the uppermost lower mantle. EGU General Assembly 2021, online. ID: EGU21-13874.

2. **Tian, D.**, & Wei, S. S. (2021). Source spectra and stress drops of small-to-moderate earthquakes beneath the Alaska peninsula. 2021 AGU Fall Meeting, online. ID: T54A-11.

1. **Tian, D.**, & Wen, L. (2017). Seismological evidence for a localized mushy zone at the Earth's inner core boundary. 2017 Annual Meeting of Chinese Geoscience Union, Beijing, China.

Poster

21. Zhang, Y., Byrnes, J. S., Wei, S. S., **Tian, D.**, Wang, F., & Bezada M. (2021). P-wave attenuation tomography of the Tonga-Lau mantle wedge improved by a Bayesian Monte Carlo approach and independently constrained source spectra. 2021 AGU Fall Meeting, online. ID: S25D-0276.

20. **Tian, D.**, Wang, W., Wang, F., & Wei, S. S. (2020). Source spectra of intermediate-depth and deep earthquakes in the Tonga subduction zone. 2020 AGU Fall Meeting, online. ID: S054-0012.

19. Wei, S. S., **Tian, D.**, Shearer, P. M., Lv, M., Dorfman, S. M., Lithgow-Bertelloni, C., & Stixrude, L. (2020). Compositional heterogeneities in the mid-mantle revealed by seismic discontinuities and reflectors. 2020 AGU Fall Meeting, online. ID: DI016-0008.

18. **Tian, D.**, Wang, W., & Wei, S. S. (2019). Source spectra and stress drop of deep earthquakes in the Tonga subduction zone. 2019 AGU Fall Meeting, San Francisco, CA, USA. ID: S13C-0458.
17. **Tian, D.**, Wei, S. S., & Shearer, P. M. (2019). Global variations of the 520-km discontinuity. Gordon Research Conference: Interior of the Earth, South Hadley, MA, USA.
16. **Tian, D.**, Wei, S. S., & Shearer, P. M. (2018). Global variations of the 520-km discontinuity. 2018 AGU Fall Meeting, Washington, DC, USA. ID: DI31C-0024.
15. **Tian, D.**, Yao, J., & Wen, L. (2017). Collapse and earthquake swarm after North Korea's 3 September 2017 nuclear test. 2017 AGU Fall Meeting, New Orleans, LA, USA. ID: S43H-2968.
14. **Tian, D.**, & Wen, L. (2017). Three types of Earth's inner core boundary. 2017 AGU Fall Meeting, New Orleans, LA, USA. ID: DI33B-0404.
13. Yao, J., **Tian, D.**, & Wen, L. (2017). High-precision location, yield and tectonic release of North Korea's 3 September 2017 nuclear test. 2017 AGU Fall Meeting, New Orleans, LA, USA. ID: S43H-2967.
12. Yao, J., **Tian, D.**, Sun, L., & Wen, L. (2017). Temporal change of seismic Earth's inner core phases: Inner core differential rotation or temporal change of inner core surface? 2017 AGU Fall Meeting, New Orleans, LA, USA. ID: DI33B-0405.
11. **Tian, D.**, & Wen, L. (2017). Seismological evidence for a localized mushy zone at the Earth's inner core boundary. Gordon Research Conference: Interior of the Earth, South Hadley, MA, USA.
10. Yao, J., **Tian, D.**, Sun, L., & Wen, L. (2017). Temporal change of seismic Earth's inner core phases: Inner core differential rotation or temporal change of inner core surface? Gordon Research Conference: Interior of the Earth, South Hadley, MA, USA.
9. **Tian, D.**, & Wen, L. (2016). Seismic structures of the Earth's inner core boundary beneath the Bearing sea and Mexico. 2016 AGU Fall Meeting, San Francisco, CA, USA. ID: DI43A-2657.
8. **Tian, D.**, & Wen, L. (2015). Varying seismic property of the Earth's inner core boundary. 2015 AGU Fall Meeting, San Francisco, CA, USA. ID: DI33A-2606.
7. **Tian, D.**, & Wen, L. (2014). Seismic study on the properties of the Earth's inner core boundary. 2014 AGU Fall Meeting, San Francisco, CA, USA. ID: DI31B-4269.
6. **Tian, D.**, & Wen, L.(2014). Topography and properties of the Earth's inner core boundary. 2014 Annual Meeting of Chinese Geophysical Society, Beijing, China.
5. Chen, X., **Tian, D.**, & Wen, L. (2013). Seismic tracking of Hurricane Sandy. 2013 AGU Fall Meeting, San Francisco, CA, USA. ID: S11A-2296.
4. **Tian, D.**, & Wen, L. (2013). Regional topography variation of Earth's inner core boundary. 2013 AGU Fall Meeting, San Francisco, CA, USA. ID: DI23A-2282.
3. Zhang, M., **Tian, D.**, & Wen, L. (2013). A new method for earthquake determination: stacking multiple-station autocorrelograms. 2013 AGU Fall Meeting, San Francisco, CA, USA. ID: S51A-2301.

2. **Tian, D.**, & Wen, L. (2013). Simulating wave propagation in a faulted medium using a finite difference method. 2013 Annual Meeting of Chinese Geophysical Society, Kunming, Yunnan, China.
1. **Tian, D.**, & Wen, L. (2012). Simulating wave propagation in a faulted medium using a 3D finite difference method. 2012 AGU Fall Meeting, San Francisco, CA, USA. ID: S43A-2458.

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 Forcasting, China Earthquake Administration
2016/09/21	Hubei Earthquake Administration
2016/06/30	China Earthquake Networks Center

Teaching Experience

Undergraduate Courses

- Continuum Mechanics (2025)
- Earth Science Plotting with GMT (2025)

Workshops

- 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)
- Instructor, InSAR Theory and Practice Summer Short Course: GMTSAR and Beyond (2024)

Students Supervised

Doctoral Students

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

Master Students

- ZHAO Haoliang, CUG, 2023/09–
- LIU Xiaoyu, CUG, 2023/09–
- YAN Jun, CUG, 2024/09–

Undergraduate Students

- ZHOU Xinyu, CUG, 2024/09–2025/06 (Outstanding Undergraduate Thesis Award)
- MAI Hongxuan, CUG, 2023/11–2024/06
- SONG Yangqi, CUG, 2022/02–2022/06

Field Experience

- **LEEP** (**L**ake **E**rie **E**arthquake ex**P**eriment), 2018/10/12–2018/10/16, install 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. Leading developer
2018–present	**GMT** | `https://www.generic-mapping-tools.org/` Generic Mapping Tools. Core developer