Dongdong Tian

Postdoctoral Research Associate

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Education

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

Employment

08/2018 – present	**Postdoctoral Research Associate**, Michigan State University, East Lansing, MI, USA

Research Interests

- Structure of the Earth's Deep Interior
- Mechanisms of Small Seismic Events (Microseisms, Nuclear Explosions, Collapses)
- Numerical Simulation of Wave Propagation in Complex Media
- Full Waveform Inversion
- Seismic Interferometry

Professional Societies & Activities

2012 – present	Member of the American Geophysical Union (AGU)
2013 – present	Author of the SeisMan blog (popular among Chinese young seismologists)
2016 – 2018	Research assistant and database manager for China Seismological Reference Model
2016 – present	Founder and primary contributor of GMT China Community
2017 – present	Peer-reviewer of scientific journals: *Geophysical Research Letters* (1), *Seismological Research Letters* (2), *Review of Scientific Instruments* (1), *Journal of Open Source Software* (2)
2018 – present	Core developer of the Generic Mapping Tools (GMT) and PyGMT
2018 – 2019	Judge for the Outstanding Student Paper Award, AGU Fall Meeting
2019 – 2020	Instructor, the UNAVCO Short Course "The Generic Mapping Tools for Geodesy"
2019	Instructor, Workshop SCIWS4: "Become a Generic Mapping Tools Contributor Even If You Can't Code", 2019 AGU Fall Meeting

Awards & Honors

2018 President Award, Chinese Academy of Science, China [*top 1%*]

2018 Outstanding Graduate Student, University of Science and Technology of China, China [*top 15%*]

2017 Outstanding Student Paper Award, 2017 Annual Meeting of Chinese Geoscience Union, China

2017 National Scholarship for Doctoral Students, Ministry of Education, China [*top 5%*]

2014 Kwang-Hua Scholarship, Kwang-Hua Education Foundation, China

2010 Kwang-Hua Scholarship, Kwang-Hua Education Foundation, China

2009 Outstanding Volunteer, University of Science and Technology of China, China

Peer-reviewed Publications

*corresponding author, #co-first author.

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*, *in press*

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*. 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*, 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

Papers submitted/under revision

1. Wei, S. S., Shearer, M. P., Lithgow-Bertelloni, C., Stixrude, L., **Tian, D.** Oceanic plateau of the Hawaiian mantle plume head subducted to the uppermost lower mantle.

Papers in Preparation

4. **Tian, D.**, Wang, W. & Wei, S. S. Source spectra and stress drop of deep earthquakes in the Tonga subduction zone.

3. **Tian, D.**, & Wen, L. Improved relative moment tensor inversion method and applications to clusters of small earthquakes.

2. **Tian, D.**, & Wen, L. Three types of Earth's inner core boundary.

1. **Tian, D.**, & Wen, L. Simulating wave propagation in a faulted medium using a 3D finite difference method.

Meeting Abstracts

16. **Tian, D.**, Wang, W. & Wei, S. S. (2019) Source spectra and stress drop of deep earthquakes in the Tonga subduction zone. Abstract S13C-0458 presented at 2019 AGU Fall Meeting, San Francisco, CA, USA.

15. **Tian, D.**, Wei, S. S., & Shearer, M. P. (2019) Global variations of the 520-km discontinuity. Presented at Gordon Research Conference: Interior of the Earth, South Hadley, MA, USA.

14. **Tian, D.**, Wei, S. S., & Shearer, M. P. (2018) Global variations of the 520-km discontinuity. Abstract DI31C-0024 presented at 2018 AGU Fall Meeting, Washington, DC, USA.

13. **Tian, D.**, Yao, J., & Wen, L. (2017). Collapse and earthquake swarm after North Korea's 3 September 2017 nuclear test. Abstract S43H-2968 presented at 2017 AGU Fall Meeting, New Orleans, LA, USA.

12. **Tian, D.**, & Wen, L. (2017). Three types of Earth's inner core boundary. Abstract DI33B-0404 presented at 2017 AGU Fall Meeting, New Orleans, LA, USA.

11. Yao, J., **Tian, D.**, & Wen, L. (2017). High-precision location, yield and tectonic release of North Korea's 3 September 2017 nuclear test. Abstract S43H-2967 presented at 2017 AGU Fall Meeting, New Orleans, LA, 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? Abstract DI33B-0405 presented at 2017 AGU Fall Meeting, New Orleans, LA, USA.

9. **Tian, D.**, & Wen, L. (2017). Seismological evidence for a localized mushy zone at the Earth's inner core boundary. Presented at Gordon Research Conference: Interior of the Earth, South Hadley, MA, USA.

8. 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? Presented at Gordon Research Conference: Interior of the Earth, South Hadley, MA, USA.

7. **Tian, D.**, & Wen, L. (2016). Seismic structures of the Earth's inner core boundary beneath the Bearing sea and Mexico. Abstract DI43A-2657 presented at 2016 AGU Fall Meeting, San Francisco, CA, USA.

6. **Tian, D.**, & Wen, L. (2015). Varying seismic property of the Earth's inner core boundary. Abstract DI33A-2606 presented at 2015 AGU Fall Meeting, San Francisco, CA, USA.

5. **Tian, D.**, & Wen, L. (2014). Seismic study on the properties of the Earth's inner core boundary. Abstract DI31B-4269 presented at 2014 AGU Fall Meeting, San Francisco, CA, USA.

4. Chen, X., **Tian, D.**, & Wen, L. (2013). Seismic tracking of hurricane sandy. Abstract S11A-2296 presented at 2013 AGU Fall Meeting, San Francisco, CA, USA.

3. **Tian, D.**, & Wen, L. (2013). Regional topography variation of Earth's inner core boundary. Abstract DI23A-2282 presented at 2013 AGU Fall Meeting, San Francisco, CA, USA.

2. Zhang, M., **Tian, D.**, & Wen, L. (2013). A new method for earthquake determination: stacking multiple-station autocorrelograms. Abstract S51A-2301 presented at 2013 AGU Fall Meeting, San Francisco, CA, USA.

1. **Tian, D.**, & Wen, L. (2012). Simulating wave propagation in a faulted medium using a 3D finite difference method. Abstract S43A-2458 presented at 2012 AGU Fall Meeting, San Francisco, CA, USA.

Talks

7. **Tian, D.** Global variations of the 520-km discontinuity. *2nd Annual Earth and Environmental Sciences Student Research Symposium*, Department of Earth and Environmental Sciences, Michigan State University, East Lansing, MI, USA. Feb. 23, 2019. **[5 minutes lightning talk]**

6. **Tian, D.** Collapse and earthquake swarm after North Korea's 2017 nuclear test. *Institute of Geology and Geophysics, Chinese Academy of Sciences*, Beijing, China. Jun. 15, 2018.

5. **Tian, D.** Seismological evidence for a localized mushy zone at the Earth's inner core boundary. *Institute of Geology and Geophysics, Chinese Academy of Sciences*, Beijing, China. Jun. 15, 2018. **[invited]**

4. **Tian, D.** Fine-scale structure of the Earth's inner core boundary and aftershocks of North Korea's 2017 nuclear test. *Institute of Earthquake Forcasting, China Earthquake Administration*, Beijing, China. Jun. 14, 2018.

3. **Tian, D.** Seismological evidence for a localized mushy zone at the Earth's inner core boundary. *2017 Annual Meeting of Chinese Geoscience Union (CGU)*, Beijing, China. Oct. 17, 2017. **[invited]**

2. **Tian, D.** Getting started with GMT in 60 minutes. *Workshop on Analysis and Applications of Crustal Deformation Data*, Wuhan, China. Sep. 21, 2016. **[invited]**

1. **Tian, D.** Seismic study on the properties of the Earth's inner core boundary. *China Earthquake Networks Center*, Beijing, China. Jun. 30, 2016. **[invited]**

Field Experience

- **LEEP** (**L**ake **E**rie **E**arthquake ex**P**eriment), 10/12/2018 – 10/16/2018, install 8 broadband seismic stations around Lake Erie.

Open Source Software

**Year indicates when the project was started. All projects are currently ongoing.*

2014 **HinetPy** – A python package to request and process seismic waveform data from Hi-net. https://github.com/seisman/HinetPy/

Expertise & Skills

Languages	Mandarin Chinese, English.
Driving	Michigan Driver License.
Programming	C, Python, Fortran, Perl, Shell, MPI, LaTeX.
Seismological Tools	SAC, GMT, SOD, ObsPy, TauP.
Waveform modeling	Reflectivity Method, Finite Difference Method, Generalized Ray Theory, GRT-FD Hybrid method.
Others	gCAP (moment tensor inversion), Match&Locate (Small event detection and location), hk (receiver function).