# Tomoya Takano

Chief Researcher
National Research Institute for
Earth Science and Disaster Resilience (NIED)
3-1, Tennodai, Tsukuba,
Ibaraki, 305-0006, JAPAN

## Personal Data

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| Place of Birth: | Nishitokyo city, Japan |
| Current city: | Tsukuba city, Ibaraki, Japan |
| Email: | takanot@bosai.go.jp |
| Homepage | https://tomoyatakano.github.io |

## Educational Background

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| *4/2016 – 3/2019* | Ph.D. Geophysics, Tohoku University |
| *4/2012 – 3/2014* | M.S. Geophysics, Tohoku University |
| *4/2008 – 3/2012* | B.S. Geophysics, Tohoku University |

## Thesis Titles

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| *Ph.D.* | Temporal changes in seismic velocity of shallow structures at active volcanoes as inferred from analyses of ambient noise correlations |
| *M.S.* | Detection of seismic velocity changes caused by the Earth tides with a seismic interferometry method |
| *B.S.* | Estimation of seismic velocity changes by using auto correlation functions of ambient noise recorded at Hi-net stations |

## Awards

- JSPS Postdoctoral Fellowship (Japan Society for the Promotion of Science), 2019-2021
- Tohoku University Presidential Award, Tohoku University, Japan, 2019
- JSPS Doctoral Course Fellowship (Japan Society for the Promotion of Science), 2017-2019
- Outstanding student paper award, 2018, by Japan Volcanological Society, about the paper, Takano *et al.*, 2017 and Takano *et al.*, 2014
- Outstanding presentation award, 2017, Japan Seismological Society
- Journal Highlights by *J. Geophys. Res.*, about the papar, Takano *et al.*, 2017, *J. Geophys. Res.*,

## Grants

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| *4/2022 – 3/2025* | **Tomoya Takano (PI)**, High temporal resolution monitoring of pore fluid pressure in the crust, *JSPS KAKENHI*, Grant-in-Aid for Early-Career Scientists, #22K14110 |
| *4/2019 – 3/2022* | **Tomoya Takano (PI)**, Development of different size of array: Toward estimating stress sensitivity in deeper region, *Japan Society for the Promotion of Science* (*JSPS*), Postdoctoral Fellow |
| *4/2017 – 3/2019* | **Tomoya Takano (PI)**, Characteristics of stress sensitivity of seismic velocity changes by using seismic interferometry, *Japan Society for the Promotion of Science* (*JSPS*), Doctoral Course Students, #17J02025 |

## Research Experience

### *Postdoctoral Research*

Earthquake Research Institute, the University of Tokyo and ISTerre, Université Grenoble Alpes (research advisor: Dr. Kiwamu Nishida and Dr. Florent Brenguier)

- Cross-correlations of ambient noise and earthquake waveforms from a dense network of permanent ocean bottom seismometers offshore Honshu, Japan
- Extracting tidal response of seismic velocity changes using a state-space model throughout Japan

### *Doctoral Research*

Department of Geophysics, Graduate School of Science, Tohoku University, 4/2016 – 3/2019 (research advisor: Dr. Takeshi Nishimura)

- Depth dependence of stress sensitivity of seismic velocity changes
- Sensitivity of seismic velocity changes to tidal deformation at different lapse-times
- Noise-based passive ballistic wave seismic monitoring on an active volcano
- Seismic velocity changes in response to different directions of tidal deformation

### *Master Course's Research*

Department of Geophysics, Graduate School of Science, Tohoku University, 4/2012 – 3/2014 (research advisor: Dr. Takeshi Nishimura)

- Seismic velocity changes caused by the Earth tide: Ambient noise correlation analyses of small-array data

## Research Interests

My research focuses on understanding the spatiotemporal changes of the Earth's structure using seismic waves. I'm particularly interested in a complex response of geomaterials to hydrological changes, volcanic activities, earthquake shaking, and static stress or strain variations. I have been involved in extracting the crustal response to applied static strain using ambient seismic noise and earth tides.

## Prior Employment

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| *4/2014 – 9/2015* | Japan Radio Co., Ltd. (as a marine electronics engineer) |
| *10/2015 – 3/2016* | Technical Staff at Tohoku University |

## Positions Held

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| *3/2021 – 3/2024* | Chief Researcher, National Research Institute for Earth Science and Disaster Resilience (NIED) |
| *3/2021 – 3/2024* | Assistant Professor at Hirosaki University |
| *5/2019 – 3/2020* | Visiting Researcher at ISTerre, Université Grenoble Alpes |
| 4/2019 – 3/2022 | Postdoctoral Fellowship of Japan Society for the Promotion of Science, Earthquake Research Institute, the University of Tokyo |
| 4/2018 – 10/2018 | Visiting student at ISTerre, Université Grenoble Alpes (Supervisor: Dr. Florent Brenguier and Dr. Michel Campillo) |
| 3/2017 – 3/2017 | Internship at Meteorological Research Institute |
| 4/2017 – 3/2019 | Research Fellow of the Japan Society for the Promotion of Science (DC2) |
| 10/2015 – 3/2016 | Technical Staff at Department of Geophysics, Tohoku University |
| 4/2014 – 9/2015 | Marin electronics engineer at Japan Radio Co., Ltd. |

## Publications

### *Journal Articles*

1. **Takano, T.**, Nishimura, T., Nakahara, H. (2023), Anisotropic seismic velocity variations in response to different orientations of tidal deformations. Geophysical Journal International, 235(3), 2716-2726, https://doi.org/10.1093/gji/ggad386
2. **Takano, T.** and Nishida, K. (2023), Tidal response of seismic wave velocity at shallow crust in Japan, Geophysical Research Letters, 50(9), e2023GL103011
3. Hogawa, R., Maeda, T., **Takano, T.**, and Noguchi, S. (2023), Estimation of site amplification factors among seismic networks around Aomori prefecture by means of coda-wave amplitude, Zisin 2, 76, 77-92, https://doi.org/10.4294/zisin.2022-18. (in Japanese)
4. Tensaka, T., Maeda, T., and **Takano, T.** (2023), Intrinsic Attenuation Structure of the Mantle Wedge beneath Hokkaido, Japan, Inferred from Seismic Wave Propagation Simulations of Deep-focus Earthquake, Zisin 2, 76, 93-107, https://doi.org/10.4294/zisin.2022-19.(in Japanese)
5. **T. Takano**, F. Brenguier, M. Campillo, A. Peltier, T. Nishimura, 2019, Noise-based passive ballistic wave seismic monitoring on an active volcano, *Geophysical Journal International*, Volume 220, Issue 1, January 2020, Pages 501–507, https://doi.org/10.1093/gji/ggz466

6. Brenguier, F., R. Courbis, A. Mordret, X. Campman, B. Boué, M. Chmiel, **T. Takano**, T. Lecocq, W. Van der Veen, S. Postif, and D. Hollis, 2019, Noise-based Ballistic Body-wave Passive Seismic Monitoring, *Geophysical Journal International*, Volume 221, Issue 1, April 2020, Pages 683–691, https://doi.org/10.1093/gji/ggz440

7. **Takano, T.**, T. Nishimura, H. Nakahra, H. Ueda, E. Fujita, 2019, Sensitivity of seismic velocity changes to the tidal strain at different lapse-times: Data analyses of a small seismic array at Izu-Oshima volcano, *Journal of Geophysical Research: Solid Earth*, *124* (3), 3011-3023, https://doi.org/10.1029/2018JB016235

8. **Takano, T.**, T. Nishimura, H. Nakahara, 2017, Seismic velocity changes concentrated at the shallow structure as inferred from correlation analyses of ambient noise during volcano deformation at izu-oshima, japan, *Journal of Geophysical Research: Solid Earth*, *122* (8), 6721-6736, doi:10.1002/2017JB014340

9. **Takano, T.**, T. Nishimura, H. Nakahara, Y. Ohta, and S. Tanaka, 2014, Seismic velocity changes caused by the earth tide: Ambient noise correlation analyses of small-array data, *Geophysical Research Letters*, *41* (17), 6131-6136, doi:10.1002/2014GL060690

## *Proceedings*

1. **Takano, T.**, F. Brenguier, M. Camillo, T. Nishimura, 2019, Temporal changes of ballistic wave velocity on Piton de la Fournaise volcano, *IUGG General Assembly*, Montreal, Canada, July 2019.

2. **Takano, T.**, T. Nishimura, H. Nakahara, 2018, Seismic velocity changes in response to different direction of tidal strain, *EGU General Assembly*, Vienna, Austria, April 2018.

3. **Takano, T.**, T. Nishimura, H. Nakahara, 2017, Estimation of strain sensitivity of seismic velocity changes using the Earth tide: Analyses of seismic small array data at Izu-Oshima volcano, Japan, *AGU Fall meeting*, New Orleans, Louisiana, USA, December 2017.

4. **Takano, T.**, T. Nishimura, H. Nakahara, H. Ueda, E. Fujita, 2017, Estimation of strain sensitivity of seismic velocity changes using the Earth tide: Noise correlation analyses of small seismic array data at Izu-Oshima volcano, *Seismological Society of Japan Fall meeting*, S01-08, Kagoshima, Japan, October, 2017 (in Japanese)

5. **Takano, T.**, T. Nishimura, H. Nakahara, H. Ueda, E. Fujita, 2017, Strain sensitivity of seismic velocity changes at the shallow part of Izu-Oshima volcano: Ambient noise correlation analyses of small seismic array data, *Volcanological Society of Japan Fall Meeting*, SSS11-P12, Kumamoto, Japan, September, 2017 (in Japanese)

6. **Takano, T.**, T. Nishimura, H. Nakahara, H. Ueda, E. Fujita, 2017, Estimation of strain sensitivity of seismic velocity changes by using the tidal strain at Izu-Oshima volcano, *Scattered wave workshop*,S17-21, Tokyo, Japan, September, 2017 (in Japanese)

7. **Takano, T.**, T. Nishimura, H. Nakahara, 2017, Stress sensitivity of seismic velocity changes in depth as inferred from noise correlation analyses at Izu-Oshima volcano, Japan, *IASPEI*, Kobe, Japan, July 2017.

8. **Takano, T.**, T. Nishimura, H. Nakahara, 2017, Seismic velocity changes at the shallow structure during volcanic deformation at Izu-Oshima, Japan, *Ambient Noise Imaging and Monitoring 2017*, Cargese, France, June, 2017

9. **Takano, T.**, T. Nishimura, H. Nakahara, 2017, Seismic velocity changes localized at the shallow structure: Noise correlation analyses during volcanic deformation at Izu-Oshima, Japan, *GP-EES*, Sendai, Japan, June 2017.

10. **Takano, T.**, T. Nishimura, H. Nakahara, 2017, Estimation of seismic velocity changes in response to the earth tide: Noise correlation analysis at 13 active volcanoes in Japan, *Japan Geoscience Union Meeting*, SSS11-P12, Chiba, Japan, May, 2017 (in Japanese)

11. **Takano, T.**, T. Nishimura, H. Nakahara, Y. Ohta, and S. Tanaka, 2013, Detecting temporal changes of seismic velocity in response to tidal strain: analysis of a small array data at Iwate volcano, *AGU Fall meeting*, San Francisco, California, USA, December 2013.

12. **Takano, T.**, T. Nishimura, H. Nakahara, 2016, Estimation of stress sensitivity of seismic velocity changes at Izu-Oshima volcano: Analyses of JMA seismic data with seismic interferometry , *Scattered wave workshop*, Tokyo, Japan, September, 2016 (in Japanese)

13. **Takano, T.**, T. Nishimura, H. Nakahara, 2016, Characteristics of seismic velocity changes on volcanoes using noise correlation method: Analyses of JMA seismic data, *Japan Geoscience Union Meeting*, SVC47-23, Chiba, Japan, May, 2016 (in Japanese)

14. **Takano, T.**, T. Nishimura, H. Nakahara, Y. Ohta, S. Tanaka, 2013, Detecting temporal changes of seismic velocity in response to tidal strain : analysis of a small array data at Iwate volcano, *AGU Fall meeting*, San Francisco, California, USA, December 2013.

15. **Takano, T.**, T. Nishimura, H. Nakahara, Y. Ohta, S. Tanaka, 2013, Estimation of strain sensitivity of seismic velocity changes using the Earth tide: Noise correlation analyses of small seismic array data at Izu-Oshima volcano, *Seismological Society of Japan Fall meeting*, S01-08, Yokohama, Japan, October, 2013 (in Japanese)

16. **Takano, T.**, T. Nishimura, H. Nakahara, Y. Ohta, S. Tanaka, 2013, Detection of seismic velocity changes caused by the Earth tide with seismic interferometry: Analyses of small seismic array data at the foot of Mt. Iwate, *Scattered wave workshop*, Tokyo, Japan, September, 2013 (in Japanese)

17. **Takano, T.**, T. Nishimura, H. Nakahara, S. Tanaka, 2013, An attempt of detecting seismic velocity changes caused by the Earth tide with auto correlation functions of ambient noise, *Japan Geoscience Union Meeting*, SVC47-23, Chiba, Japan, May, 2013 (in Japanese)

## Teaching

- 2023 Fall, Geology Special Experiment (co-taught 3 sessions), Hirosaki University
- 2023 Fall, Seismology I (15 sessions), Hirosaki University
- 2023 Fall, Seismology Exercise (co-taught 8 sessions), Hirosaki University
- 2023 Spring, Applied Physics Experiment (15 sessions), Hirosaki University
- 2023 Spring, Earth Environment Disaster Prevention Exercise (1 session), Hirosaki University
- 2023 Spring, Special Topics in Solid Earth Physics (15 sessions), Hirosaki University
- 2023 Spring, Special Lecture on Earth Environment Disaster Prevention (1 session), Hirosaki University
- 2022 Fall, Seismology I (15 sessions), Hirosaki University
- 2022 Fall, Seismology Exercise (co-taught 8 sessions), Hirosaki University
- 2022 Spring, Applied Physics Experiment (15 sessions), Hirosaki University
- 2022 Spring, Basic Seminar (15 sessions), Hirosaki University

- 2022 Spring, Earth Environment Disaster Prevention Exercise (1 session), Hirosaki University
- 2022 Spring, Special Topics in Solid Earth Physics (15 sessions), Hirosaki University
- 2022 Spring, Special Lecture on Earth Environment Disaster Prevention (1 session), Hirosaki University
- 2021 Fall, Geology Special Experiment (co-taught 3 sessions), Hirosaki University
- 2021 Fall, Seismology Exercise (co-taught 8 sessions), Hirosaki University
- 2021 Fall, Seismology I (co-taught 7 sessions), Hirosaki University
- 2021 Spring, Applied Physics Experiment (15 sessions), Hirosaki University
- 2021 Spring, Science and Technology English (co-taught 3 sessions), Hirosaki University
- 2021 Spring, Earth Disaster Prevention Exercise (co-taught 1 session), Hirosaki University
- 2021 Spring, Special Lecture on Earth Environment Disaster Prevention (co-taught 1 session), Hirosaki University
- 2016 Fall, Teaching assistant, Exercises in Mechanics, Tohoku University
- 2012 Spring, Teaching assistant, Experiments in Geophysics, Tohoku University

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