

Tomoya Takano

Chief Researcher
National Research Institute for
Earth Science and Disaster Resilience (NIED)
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PERSONAL DATA

PLACE OF BIRTH: Nishitokyo city, Japan
CURRENT CITY: Tsukuba city, Ibaraki, Japan
EMAIL: takanot@bosai.go.jp
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EDUCATIONAL BACKGROUND

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

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 paper, Takano *et al.*, 2017, *J. Geophys. Res.*,

GRANTS

4/2022 – 3/2025	Tomoya Takano (PI) , High temporal resolution monitoring of pore fluid pressure in the crust, <i>JSPS KAKENHI</i> , 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, <i>Japan Society for the Promotion of Science (JSPS)</i> , Postdoctoral Fellow
4/2017 – 3/2019	Tomoya Takano (PI) , Characteristics of stress sensitivity of seismic velocity changes by using seismic interferometry, <i>Japan Society for the Promotion of Science (JSPS)</i> , 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

4/2014 – 9/2015 | Japan Radio Co., Ltd. (as a marine electronics engineer)

10/2015 – 3/2016 | Technical Staff at Tohoku University

POSITIONS HELD

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 | Marine electronics engineer at Japan Radio Co., Ltd.

PUBLICATIONS

Journal Articles

1. **Takano, T.** and Nishida, K. (2024), Estimation of seismometer clock time offsets using Kalman Filter toward accurate seismic velocity change, *Geophysical Journal International*, gga322, <https://doi.org/10.1093/gji/gg>
2. **Takano, T.**, Nishimura, T., and 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>
3. **Takano, T.** and Nishida, K. (2023), Tidal response of seismic wave velocity at shallow crust in Japan, *Geophysical Research Letters*, 50(9), e2023GL103011
4. 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)
5. 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)
6. **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>

7. 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>
8. **Takano, T.**, T. Nishimura, H. Nakahara, 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>
9. **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
10. **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*, So1-o8, 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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