

Hongrui Peng

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EDUCATION

- **M.S. in Solid Earth Geophysics**, Wuhan University, GPA: 3.81/4.0 2021 - 2024 (expected)
Thesis: A Rayleigh wave attenuation tomography method based on noise interferometry (In preparation)
Advisor: Prof. Jiangtao Li
- **B.S. in Geophysics**, Wuhan University, GPA: 3.8/4.0 2017 - 2021
Thesis: The spatial-temporal analysis of hydrology and climate elements in the Mekong River Basin
Advisor: A/Prof. Hok Sum Fok
- **Minor in Computer Science and Technology**, Wuhan University, GPA: 3.68/4.0 2018 - 2020
Related Courses: Digital Logic, Discrete Mathematics, Data Structure, Object-Oriented Programming

RESEARCH INTERESTS

I am broadly interest in everything associated with seismology and tectonics, especially:

- **Seismic Ambient Noise**
 - (1) The origin and spatial-temporal variation of the seismic noise field;
 - (2) Extracting more information from interferometry (e.g., Attenuation, Body wave, Higher-modes).
- **Earth Structure Imaging**
 - (1) Attenuation tomography (esp., partial-melting body, such as magma chamber, potential crust flow);
 - (2) Fault zone imaging;
 - (3) Novel parametrization and inversion methods for complex structures.

I am also enthusiastic about learning other cutting-edge techniques, such as full-waveform inversion, and DAS seismology.

RESEARCH EXPERIENCE

- **Research Assistant**, Wuhan University 2021 - present
With Prof. Jiangtao Li, and Prof. Yudi Pan, I mainly focus on the following fields:
Ambient Noise Attenuation Tomography:
 - (1) Summarize and develop a noise interferometry based attenuation tomography workflow;
 - (2) Test and improve this workflow, and image attenuation structures in several regions (e.g., the Yellowstone National Park, NE China, Yunnan China) (ongoing).**Imaging with Short-term Nodal Arrays:**
 - (1) Use (inverse) continuous wavelet transform to separate the waveforms of higher-modes surface waves;
 - (2) Image shallow structures near Kunlun station (Antarctica) from multimodal surface waves (ongoing).**Nature of Ambient Noise Field:**
 - (1) Analyze the spatial-temporal variation of the seismic noise field with beam-forming and wavelet analysis;
 - (2) Develop effective methods to separate constructive and destructive noise in EGFs (ongoing).
- **Undergraduate Research Assistant**, Wuhan University 2018 - 2021
Hydrology and Climate: (Advisor: A/Prof. Hok Sum Fok)
 - (1) Improve the stage-discharge relationship in estuary regions by taking the tidal effect into account;
 - (2) Use sensitivity analysis to reveal monsoons' influence on precipitation and water storage in SE Asia;
 - (3) Use K-means clustering to characterize the spatial-temporal patterns of water storage.**Magnetic Field Modeling:** (Advisor: Prof. Zhengtao Wang)
 - (1) Engineer MATLAB codes for the inversion of spherical harmonic geomagnetic field models;
 - (2) Construct monthly geomagnetic field models, by utilizing measurements from ESA's Swarm mission.

PUBLICATIONS

- [1]. **Hongrui Peng**, Jiangtao Li. Rayleigh wave attenuation tomography based on ambient noise interferometry: methods and an application to Northeast China. (submitted to *Geophysical Journal International*, in moderate revision).
- [2]. **Hongrui Peng**, Hok Sum Fok, Junyi Gong, and Lei Wang (2020). Improving Stage-Discharge Relation in The Mekong River Estuary by Remotely Sensed Long-Period Ocean Tides. *Remote Sensing*.

PRESENTATIONS

- [1]. **Hongrui Peng**, Yudi Pan, Jiangtao Li, Yu Zhang, Mengkui Li, and Yuande Yang (2023/11, Poster). Estimation of shallow structure near Antarctic Kunlun station using multimodal surface wave from seismic interferometry. Geophysics Youth Forum of the Middle and Lower Yangtze River. USTC, Hefei, China.
- [2]. **Hongrui Peng** and Jiangtao Li (2023/6, Oral). Improved attenuation tomography method based on ambient noise cross-correlation. Invited talk. SUSTech, Shenzhen, China. (Presented by my advisor Jiangtao)
- [3]. **Hongrui Peng** and Jiangtao Li (2023/4, Online Oral). An improved attenuation tomography method based on ambient noise cross-correlation. EGU General Assembly 2023, Vienna, Austria.
- [4]. **Hongrui Peng** and Jiangtao Li (2023/4, Oral). Ambient noise attenuation tomography method and its application to NE China. Congress of China Geodesy and Geophysics, Wuhan, China.
- [5]. **Hongrui Peng** and Jiangtao Li (2022/11, Online Oral). An improved attenuation tomography method based on ambient noise cross-correlation: Tests on the Yellowstone National Park. Annual Meeting of CGU, Online.

HONORS AND AWARDS

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| • Outstanding Student Poster Award | 2023 |
| <i>Awarded by School of Earth and Space Sciences, USTC</i> | |
| • Hongtuchuangzhan Scholarship (~Top 3%) | 2019 |
| <i>Sponsored by Wuhan University</i> | |
| • Suyiguang Scholarship (~Top 6%) | 2018 |
| <i>Sponsored by Wuhan University</i> | |
| • Outstanding Student Scholarship (~Top 15%) | 2018/2019/2020/2022 |
| <i>Sponsored by Wuhan University</i> | |

ADDITIONAL ACTIVITIES

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| • Winter school exchange student: Academic writing course, University of Oxford | Jan. 2020 |
| • The student president of Geophysical Union of Wuhan University | 2018 - 2019 |
| • Student member of AGU and CGU | both since 2021 |

TECHNICAL SKILLS

- **Languages:** Chinese (Native), English (TOEFL:107)
- **Programming Languages:** MATLAB, Python, Shell, C, R
- **Technical Softwares:** SAC, GMT, SPECFEM2D
- **Document/Presentation:** Office platform, Adobe, Overleaf