

# Hongrui Peng

Wuhan University  
P.R.China, 430079  
No.129 Luoyu Road, Wuhan

☎ +86-18070032566  
✉ [hrpeng@whu.edu.cn](mailto:hrpeng@whu.edu.cn)  
🏠 [hrpeng2001.github.io](https://github.com/hrpeng2001)

## EDUCATION

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- **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

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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

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- **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 muti-modes 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) Write MATLAB codes for the inversion of spherical harmonic geomagnetic field models;
  - (2) Build monthly geomagnetic field models, by utilizing measurements from ESA's Swarm mission.

## PUBLICATIONS

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- [1]. **Hongrui Peng**, Jiangtao Li (2023). Rayleigh wave attenuation tomography based on ambient noise interferometry: methods and an application to Northeast China. *Geophysical Journal International*. (Under review)
- [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

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- [1]. **Hongrui Peng** and Jiangtao Li (2023/6, Oral, in Chinese). Improved attenuation tomography method based on ambient noise cross-correlation. Invited talk. South University of Science and Technology of China, Shenzhen, China. (Presented by my advisor Jiangtao)
- [2]. **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.
- [3]. **Hongrui Peng** and Jiangtao Li (2023/4, Oral, in Chinese). Ambient noise attenuation tomography method and its application to NE China. Congress of China Geodesy and Geophysics, Wuhan, China.
- [4]. **Hongrui Peng** and Jiangtao Li (2022/11, Online Oral, in Chinese). 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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- **Hongtuchuangzhan Scholarship (~Top 3%)** 2019  
*Sponsored by Wuhan University*
- **Suyiguang Scholarship (~Top 6%)** 2018  
*Sponsored by Wuhan University*
- **Oustanding Student Scholarship (~Top 15%)** 2018/2019/2020/2022  
*Sponsored by Wuhan University*

## ADDITIONAL ACTIVITES

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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

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