

Relative seismic velocity changes at Axial Seamount

Peifeng Wang¹, Yen Joe Tan¹, Shujuan Mao²,
William Wilcock³, Felix Waldhauser⁴, Maya Tolstoy⁴

¹ The Chinese University of Hong Kong, Hong Kong, China

² The University of Texas at Austin, Austin, TX, US

³ University of Washington, Seattle, WA, US

⁴ Columbia University, Palisades, NY, US

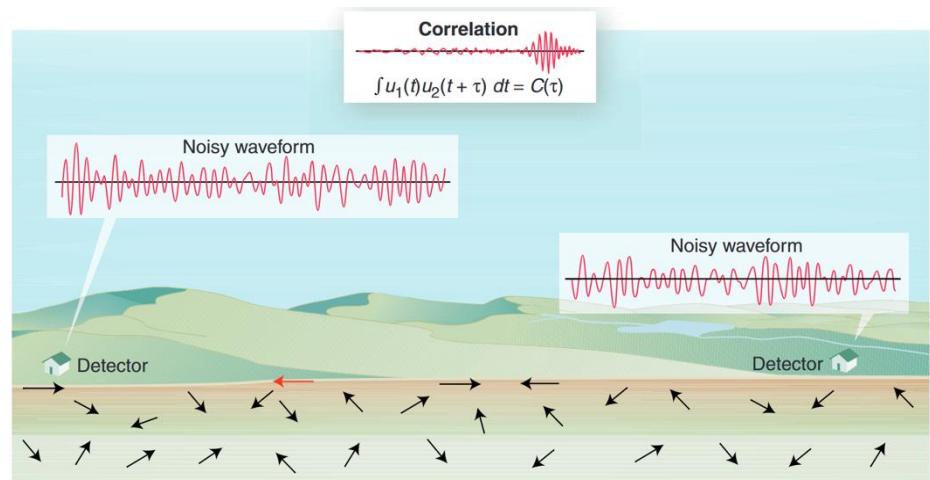


TEXAS
The University of Texas at Austin

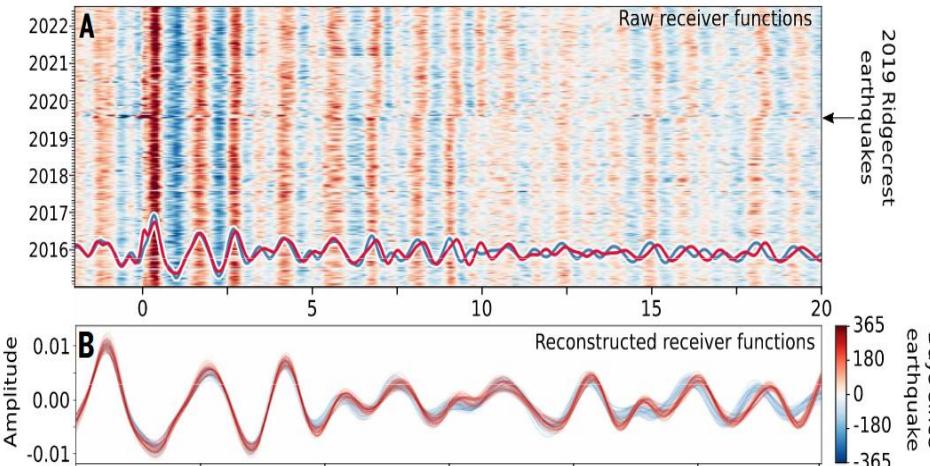
W



Information from Seismic Noise



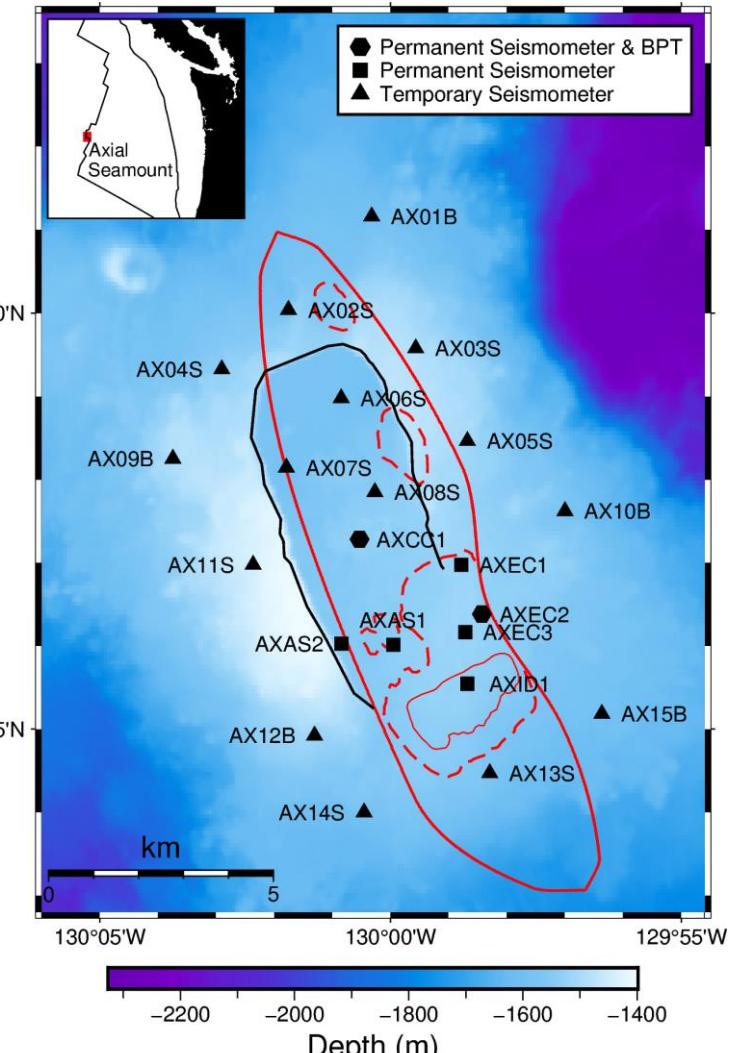
Weaver., 2005



Bryan *et al.*, 2025

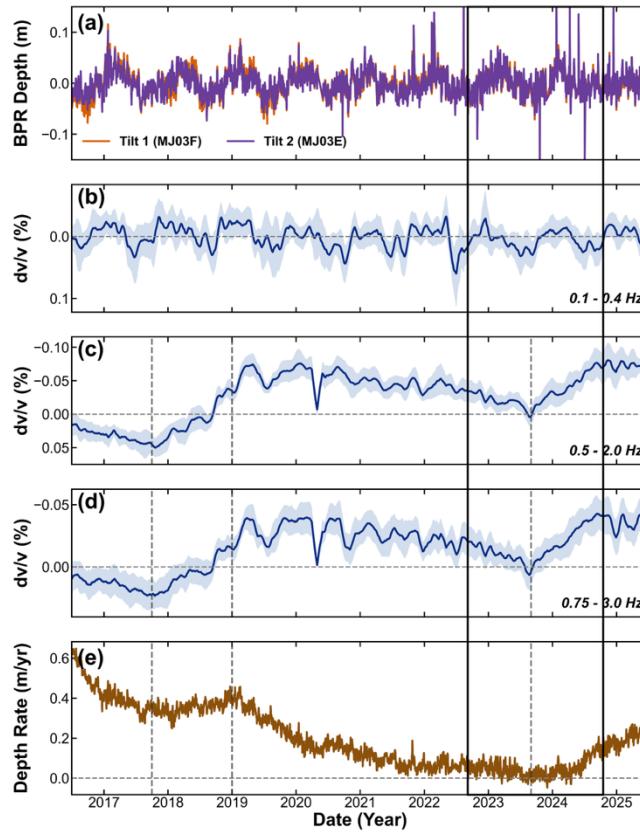
Cross-correlating ambient noise between two stations recovers the Green's function (impulse response) of the medium.

The Distribution of Stations

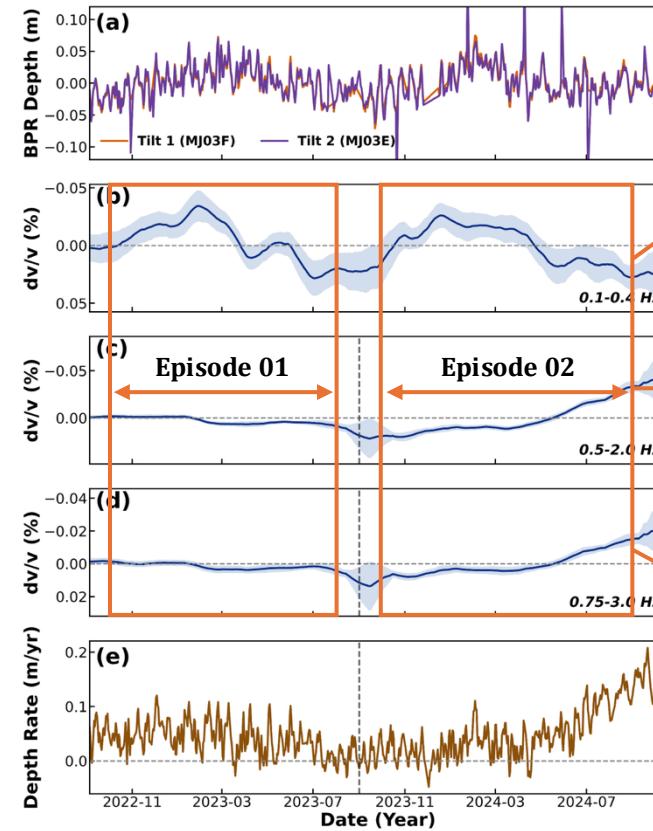


Spatiotemporal Evolution of $\delta v/v$ at Axial Seamount

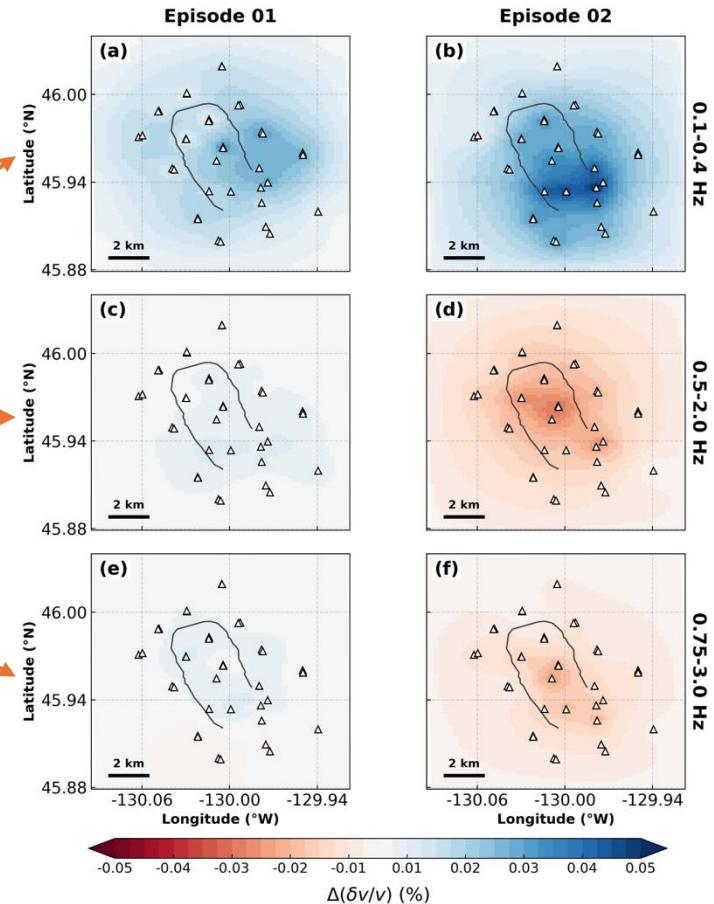
Decadal Monitoring (2015-2025)



Dense Array Period (2022-2024)



Spatial Inversion Results



0.1–0.4 Hz: Dominated by seasonal environmental noise, showing annual cyclicity consistent with the detrended tilt records.

0.5–3.0 Hz: Captures the complex volcanic cycle with **four distinct phases**:

- 1. 2015–2018** (Post-Eruption Healing);
- 2. 2018–2019** (Rapid Inflation);
- 3. 2019–2023** (Inter-eruptive Deceleration);
- 4. 2023–Present** (Re-acceleration).