

Secondary Microseismic Love Wave Generation Without Coastal Conversion

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1. Microseismic waves are continuously produced by wind-driven ocean waves interacting with the solid Earth, and are thus ubiquitous in seismic records globally.
2. How microseismic Love waves (horizontally polarized surface waves) are generated between 3–10 s periods is enigmatic.
3. Tracking the propagation of earthquake Love waves from ocean to land, we find that the boost of Love waves at continental margins is absent (3–7 s) or weak (7–10 s).

Atmosphere–Ocean–Solid-Earth interaction

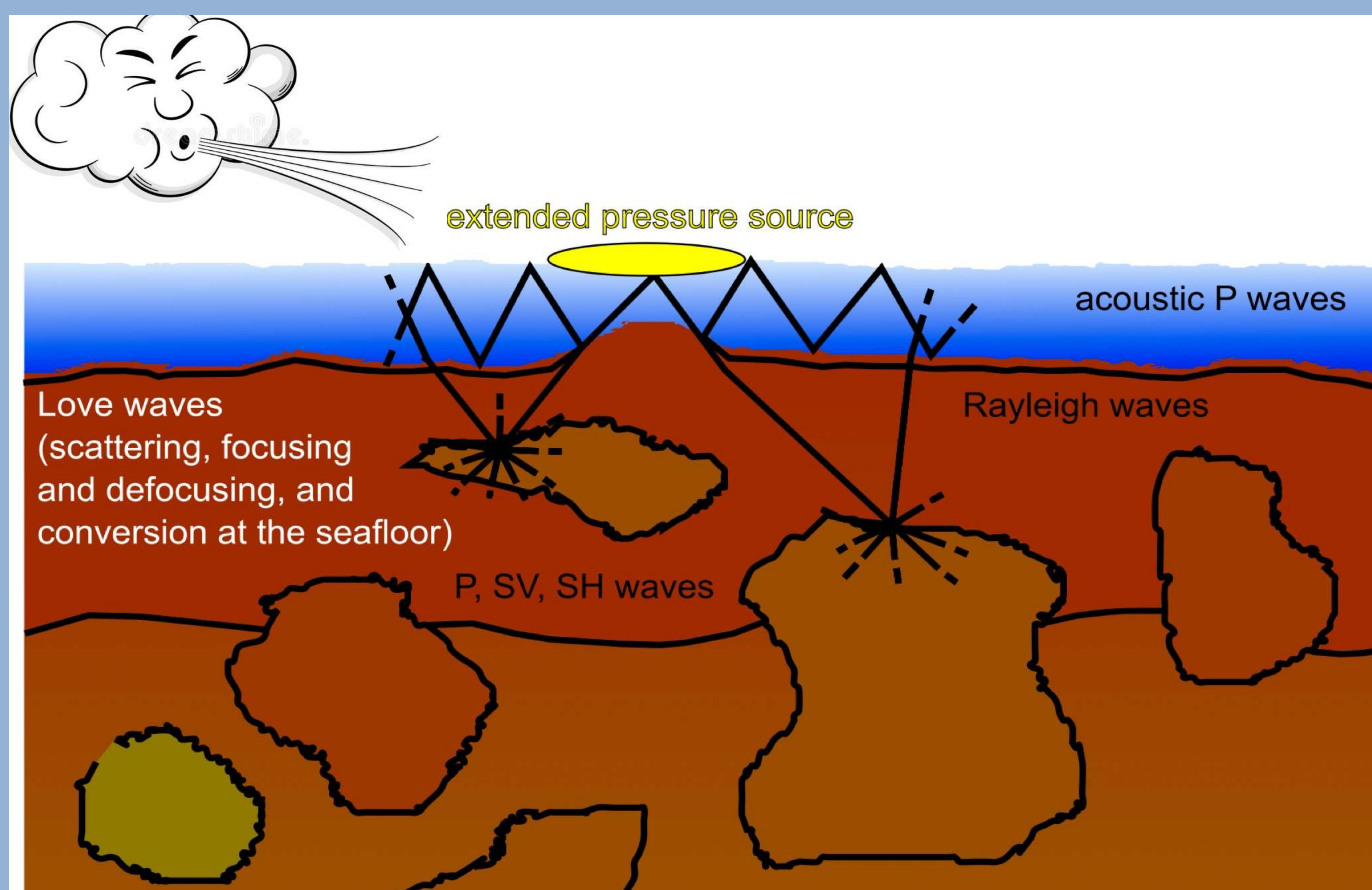


Fig. 1: Schematic of wind-driven ocean waves interacting with the solid Earth to produce microseismic waves (Gualtieri et al., 2020).

Amphibious Earthquake Love Waves are clearly observed

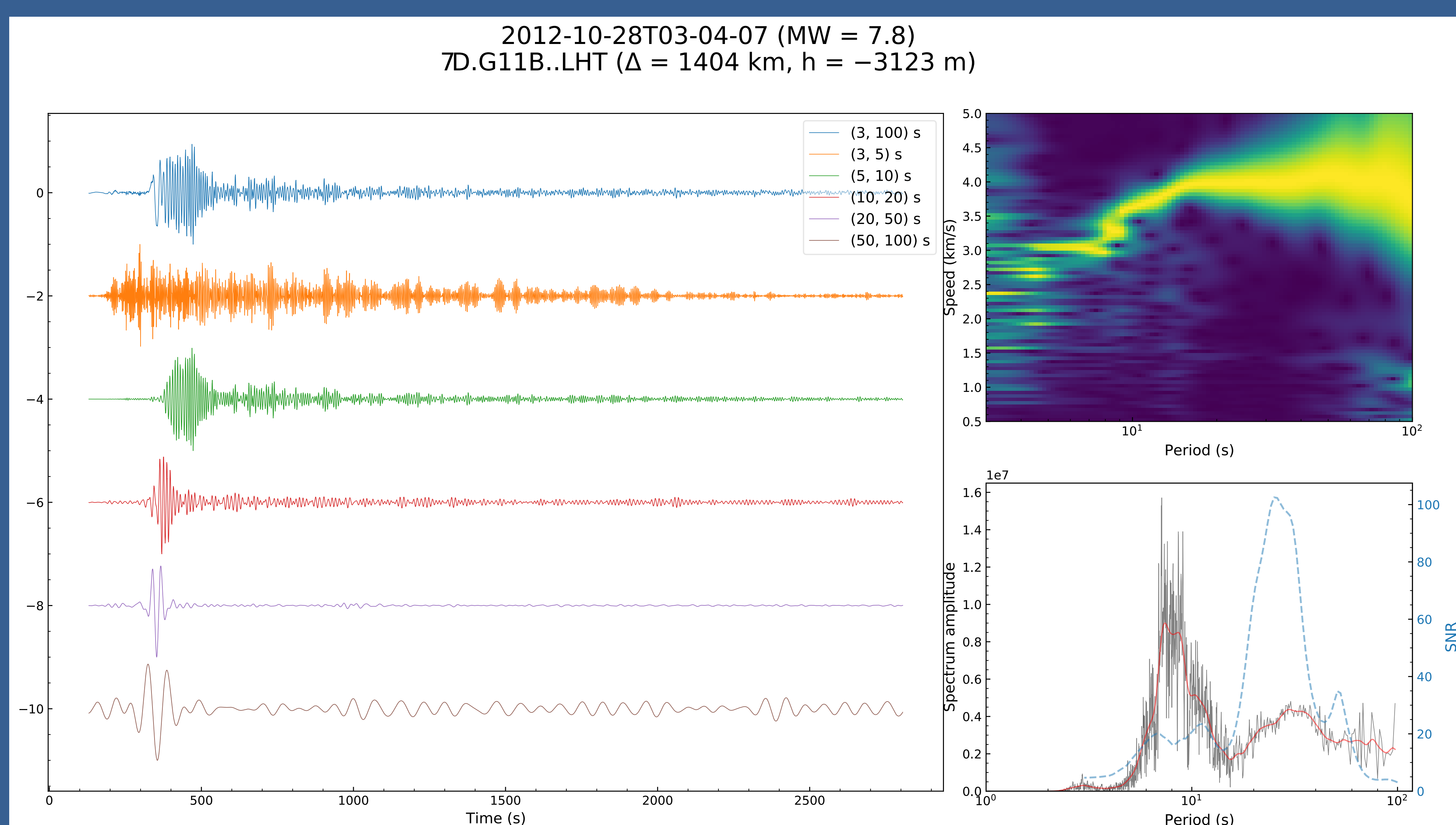


Fig. 2: Example of Earthquake Loves observed at ocean bottom.

No/Weak Love Wave Boost After Coastal Conversion

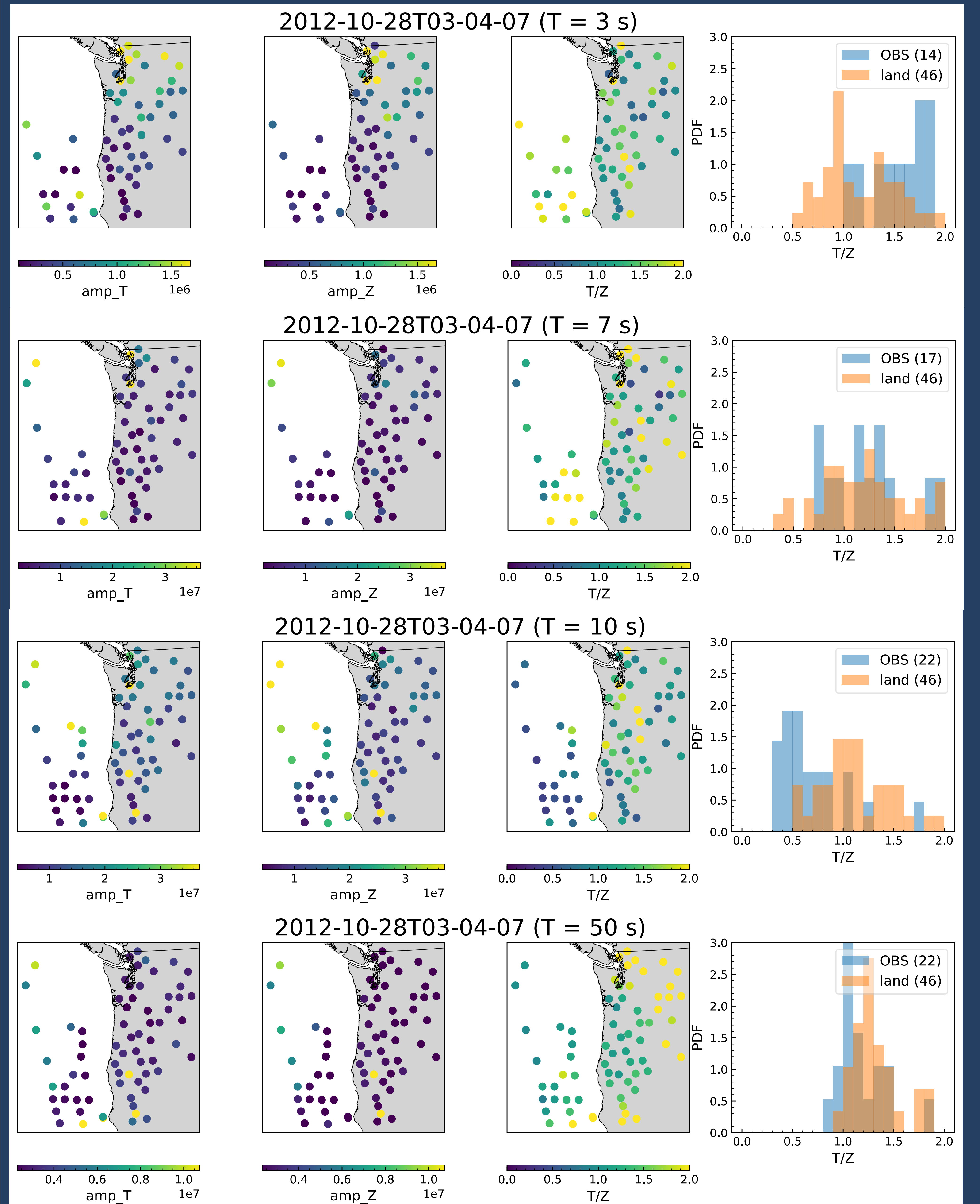


Fig. 3: Comparison of offshore vs. onshore Love wave spectral amplitudes relative to Rayleigh waves. With the period increasing from 3 s to 10 s, onshore Love waves are stronger (first row), comparable (second row), and weaker (third row) than offshore Love waves, suggesting absent to weak boost. At long periods (fourth row), Love and Rayleigh waves are comparable, ignoring the continental margins.

Acknowledgements

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Bibliography

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