

# Passive Coastal Ocean Probing by Cross-Correlating Ambient Sound on Different Time Scales

Tsu Wei Tan

*Department of Marine Science, ROC Naval Academy  
Kaohsiung, 81345, Taiwan*

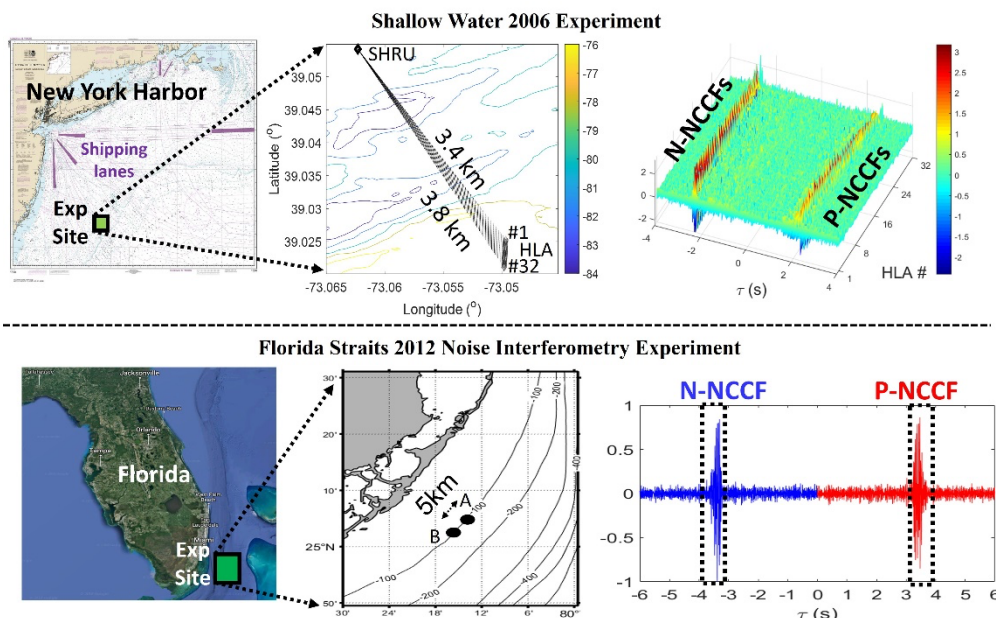
Oleg A. Godin

*Physics Department, Naval Postgraduate School  
Monterey, CA 93943, USA*

*E-mail: ttan1@nps.edu*

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Acoustic noise interferometry (NI) is a method that measures physical parameters of the ocean environment without employing any controlled sound sources. NI relies on time averaging to retrieve empirical Green's functions (EGFs) from noise cross-correlations using hydrophone pairs. In this study, we present results from two experiments where noise cross-correlation functions (NCCFs) were obtained on different time scales. The passively measured dispersion curves extracted from EGFs were then inverted to determine the geoacoustic properties of the ocean bottom at two sites and to characterize sub-seasonal sound speed variations. We found that EGFs can be retrieved at ranges of tens of ocean depths with noise averaging times of the order of a minute, with a richer frequency band and higher order normal mode content than with longer averaging times. This improves the resolution of inversions and adds value to NI-based passive acoustic characterization of the ocean.



**Keywords:** ICTCA 2023; passive acoustic remote sensing; noise interferometry; shallow water waveguide; geoacoustic inversion; SSP inversion

## References

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