

ADVANCES IN SURF INFRASOUND MONITORING

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The ability to provide infrasound estimates of breaking ocean wave height and period in shallow reefs, steep rocky coastlines, and sand beaches has been demonstrated in previous work. Yet defining the source process and isolating the source pressure function remained elusive because of ambiguity introduced by complex coastlines and multiple breaker zones. Due to the steep bathymetry and its proximity to land, the Temae reef in the northeast coast of Moorea island, French Polynesia, provided a well constrained experimental environment where individual breaking waves could be identified and recorded. Synchronous wave height, infrasonic, seismic, and visual recordings of individual waves breaking against the shallow reef ledge were made and correlated. From this we characterize a possible fluid impact source mechanism for surf infrasound, demonstrate the capability to acoustically track alongshore traveling (peeling) plunging waves, and confirm the relationship between ocean wave height and infrasonic amplitude. Depending on the swell and shoreline conditions, estimates of ocean wave period are also possible.

We also introduce preliminary results on remote infrasonic monitoring of the surf zone on the North Shore of Oahu, Hawaii, during the 2006-07 Winter high surf season.