

Department of Ocean and Resources Engineering

Seminar

Infrasonic remote sensing of breaking ocean waves in the surf and littoral zones

by

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Abstract

Infrasound stations on islands or near coastlines routinely detect subaudible atmospheric acoustic signals associated with breaking ocean waves. Infrasonic measurements, ground truth data collection, and ocean modeling have been conducted in near-shore environments in Hawaii in order to quantify relationships between infrasound and surf activity. Simultaneous infrasonic, visual, and ocean-bottom pressure sensor observations were conducted during the 2004-2005 winter swell season in two environments: a sandy coastline on the island of Kauai and a rocky coastline on the island of Hawaii. Empirical analyses have been conducted in order to determine correlations between key observables. Observations yielded a clear relationship between breaking wave height and low-frequency atmospheric sound amplitudes in the 0.5-20 Hz frequency range. The results of these experiments indicate that low-frequency sound may be used to estimate the amplitude, period, and spatial distribution of surf in the littoral zone.

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