

Ocean microseisms observed on land and seafloor

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Date: 2015/10/22

Abstract

The peak the seismic noise spectrum, called the microseism peak, is caused by ocean wave energy coupling into motion of the earth.

Secondary microseisms are observed at twice the frequency of the ocean waves and thus are termed double-frequency, or DF, microseism. The DF microseism band can be divided into short-period and long-period bands, LPDF and SPDF, respectively.

Long-period double-frequency (LPDF) band from 0.085 to 0.20 Hz generated by high-amplitude storm waves impacting long stretches of coastline nearly simultaneously.

Short-period double-frequency (SPDF) band from about 0.20 to 0.45 Hz shows a strong correlation of seismic amplitude with wind speed and direction.

Deep water, mid-ocean-generated DF microseisms are not observed at continental sites, indicating high attenuation of these signals. Because of these uncertainties and our investigation of ocean wave and microseism variability, The conclude that there is no unambiguous evidence that deep-ocean-generated microseisms are observed on land.

At near-coastal seismic stations, both LPDF and SPDF microseism levels are generally dominated by local generation at nearby shorelines.

Much of the LPDF energy at frequencies is excited in near-coastal areas and propagates quickly as Rayleigh wave modes throughout the ocean basin

Reference

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