



Simushir (January 15, 2009) and Samoa (September 30, 2009) tsunami recording in the area of South Kuril Islands

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Institute of Marine Geology & Geophysics (the Far East Branch of Russian Academy of Sciences) carried out long wave measurements in the area of South Kuril Islands with the purpose of tsunami recording closely to the seismic active zone and study long wave spectra variability depending of weather conditions. Bottom pressure gauges were installed in several harbors of Shikotan Island, near Cape Lovtsov (north-eastern end of Kunashir Island), in the Kitoviy Bay (Iturup Island) and near Cape Van-der-Lind (Urup Island). Sakhalin Tsunami Center has a cable telemetry tsunami warning station in the Severo-Kurilsk (Paramushir Island). Two tsunamis - a remote Samoa (September 30) and nearby Simushir tsunami (January 15) were recorded by different gauges in the area of South Kuril Islands and by telemetry station in Severo-Kurilsk. To examine spectral properties of long wave oscillations at each gauge, we calculated power spectral estimation using two different data segments (both 1 day length): the period preceding the tsunami event, we identified as “normal” and selected for analysis of the background signal; the “tsunami period” included tsunami caused oscillations. The spectral maxima at each station were different however they are mainly the same for each gauge for the two states (“normal” and “tsunami”). For example, well-expressed peaks with period 19 and 20 min were found in power spectra in Malokurilskaya Harbor and near Cape Van-der-Lind. Numerical modeling was used to examine spatial structure of eigen modes in different harbors and frequency-selective properties of the shelf of South Kuril islands. In the first case a peak with period 19 min is associated with zeroth resonance mode of harbor oscillations. In the case of Van-der-Lind gauge a peak with period 20 min is caused by shelf resonance effect. These examples show a great effect of local bottom topography on tsunami height on the coast