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Freak Waves Registration in 2009 in the Aniva, Bay, Okhotsk Sea

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Harbors, oil and gas platforms, and some other coastal structures are one of the most valuable facilities in coastal zones onshore and offshore requiring special operative and statistical information in high-precision on different wave regimes. Okhotsk Sea is a very important coastal area for navigation and mining operations in Far East. Within last free years, continuous measurements of sea level changes in the Aniva Bay are carried out by Special Research Bureau of Automation of Marine Researches of the Russian Academy of Sciences. The results of these measurements can be used for the interpretation of sea dynamics and wave regimes.
Freak waves are one of the special research themes. Okhotsk Sea has not been analyzed yet in case of the risk of freak waves which threat the safety of navigation and mining operations along the sea shelf. In this work we present an analysis of gauge records of a sea level from June to September of 2009 near Aniva cape (southern coast of Sakhalin island). Background excitement in this area rather weak (average heights of waves about 10 cm, however the height of waves increases in storm conditions to 50 cm). For this period was registered 394 abnormal big waves (freak waves) -the wave height in two and more times exceeds considerable height of a wave, from them 6 cases when excess reaches 2.5 are resulted. These records help us to understand the mechanism of freak waves in this region such as the dispersion enhancement of transient wave groups, geometrical focusing in basins of variable depth, and wave-current interaction. A numerical model study will be performed to understand the physical mechanisms of the freak wave phenomenon and to select areas in Okhotsk Sea having the highest or lowest values of the probability of freak waves depending on hydrological and meterological conditions in the study zone.
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