

Wave characteristics in the southern part of the Sea of Okhotsk – the area of water transport routes to the southern Kuril Islands

Dmitry P. Kovalev <https://orcid.org/0000-0002-5184-2350>, d.kovalev@imgg.ru

Petr D. Kovalev <https://orcid.org/0000-0002-7509-4107>, p.kovalev@imgg.ru

Aleksandr S. Borisov <https://orcid.org/0000-0002-9026-4258>, a.borisov@imgg.ru

Konstantin V. Kirillov <https://orcid.org/0000-0002-0822-3060>, k.kirillov@imgg.ru

Institute of Marine Geology and Geophysics, FEB RAS, Yuzhno-Sakhalinsk, Russia

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Abstract. This paper describes the results of studying the waves in the southern part of the Sea of Okhotsk on the sea routes between Sakhalin and Iturup islands by means of autonomous wave recorders. The study was performed in order to improve the safety of the maritime transport system and ensure its safe functioning. Analysis of the wave regime and weather conditions in the southern part of the Sea of Okhotsk, has shown that a cyclone of any direction approaching the southern part of the Sea of Okhotsk, causes sea waves with heights of more than 1.7 meters in the considered water area and nearshore of Iturup Island. However, if a cyclone approaches Sakhalin Island from the northwest direction, the height of wind waves and swell in the coastal area of the southeast of the island is small, and here is an opportunity for ships to take shelter from the storm. The analysis of long waves with tidal harmonic periods of 4 hours and more has shown, that they have almost the same oscillation phase for both islands. The internal waves caused by the local features of bathymetry and relief of the coastal zone for each adjacent water area are analyzed. Surface gravitational waves with a period of about 2.8 hours were detected at Kuibyshevsky and Kurilsky bays, and waves with a period of 2.4 hours were detected near the Okhotskoye village at Sakhalin Island. It is shown that the highest Q-factor in the Kurilsk region has the resonant water area for the periods of 4.5 minutes. It is noted that for these waves the phenomenon of a tyagun (harbour oscillations) can be expected during a storm at sea.

Keywords:

infragravity wave, sea route, sea level fluctuations, tides, wind wave and swell, internal wave, seiches, cyclones

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