

Autonomic bottom pressure stations for remote recording of tsunami waves

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Abstract. The idea of creating a network of hydrophysical stations in the open ocean to measure tsunami waves approaching the coast was formulated in the early 1960s by Professor Soloviev. The Far East Scientific Center of Russia elaborated and tested several remote bottom pressure instruments connected by cable lines with shore multi-channel recorders. These stations were situated on the shelf of the South Kuril Islands, Kamchatka, and Sakhalin. These cable stations were relatively safe and long lasting but could not be used for deep-sea tsunami recording due to the high expense of such measurements. A new autonomic bottom pressure station (ABPS) elaborated by the P.P. Shirshov Institute of Oceanology for long-term monitoring of tsunami waves in the open ocean is based on a precise laser pressure sensor. The standard station includes a microprocessor for long-term data storage, buoyancy, anchors, release and flashing systems, radio transmitter, etc. Such equipment is rather complicated and expensive. The price of ABPS can be sufficiently reduced and the effectiveness can be improved by including an acoustic transmitter to transfer the data from ABPS to the shore receiver. The developed underwater digital acoustic communication system includes microprocessor, analog-digital converter, synchronous filter, power amplifier, and sea-surface antenna. Elaboration of ABSP is supported by the Russian Foundation for Basic Research.

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