B. A. Dolgoshein. *Possibility of acoustic detection of neutrinos in the ocean.* Askar'yan[1] was the first to show that it is possible to detect ionizing radiations in water by using an acoustic signal. The most interesting application of this technique is in detection of hadron cascades triggered by high-energy cosmic neutrinos deep in the ocean.[2] Depth (~ several kilometers) is necessary both from the standpoint of shielding from cosmic muons and to obtain optimum conditions for reception of the weak acoustic signals.

It has now been established in accelerator-beam experiments[3] that the fraction of the energy going into formation of the acoustic signal (in the 10–20 kHz band) is only 10^{-12} to 10^{-10} of the absorbed ionization energy, and that the sound-radiating mechanism appears to rest largely on thermal expansion[4] of the water. The signal should have[4] a highly characteristic spatial structure (a sound "disk" ~1 km in diameter and ~10 m thick, with its axis coinciding with the direction of the neutrino), and this makes it possible to consider the possibility of building a neutrino telescope with an angular accuracy of ~1°.

The possibility of using this technique in the neutrino astronomy of superhigh energies ($\gtrsim 10^{15}$ to 10^{16} eV) requires the development of experimental systems with masses of $\sim 10^{11}$ tons (10 km × 10 km × 1 km of ocean water). In this case, the acoustic method is evidently the only feasible alternative owing to the high transparency of water to sound and the possibility of "listening through" such large volumes of matter.

Practical realization of such a detector requires both detailed study of the ocean's noise characteristics at depths of several kilometers (angular and frequency distributions, statistics, etc.) and the development of a technique for coherent reception of weak acoustic signals by a large number ($\sim 10^5$) of hydrophones.

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[3]L. Sulak *et al.*, Nucl. Instr. and Methods 161, 203 (1979).
[4]G. A. Askarian, V. A. Dolgoshein, A. N. Kalinovsky, and N. A. Mokhov, *ibid.* 164, 267 (1979).