

SYSTEM OF SOUND UNDERWATER COMMUNICATION WITH USE COMPLEX PHASE-MANIPULATED SIGNALS AND TIME-REVERSAL MIRROR

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ABSTRACT

Operative and reliable information transfer to underwater conditions control stations, underwater observatories and to unmanned autonomous underwater vehicles is the important element of upgrading of functioning efficiency for the hydroacoustic means located on sea ranges. Development of underwater sound communication systems for transfer of control commands by using of complex phase-manipulated signals and the method of the time-reversal mirror is obviously necessary for maintenance of working capacity of such systems. The assumption of slowness of control process has allowed lowering requirements to transfer speed and paying basic attention to reliability of information transfer via hydroacoustic communication link.

The scheme of two-channel correlation processing of complex phase-manipulated signals and special time reversal coder provides for efficiency of functioning of a communication system. Efficiency of such approach to construction of underwater sound communication system has been proved as a result of full-scale and laboratory experiments. Full-scale experiments were carried out in a shelf zone of the Sea of Japan near to Schultz's peninsula in area of acoustic-hydrophysical range of Pacific Oceanological Institute, FEB RAS.

Key words: ocean acoustic tomography, reciprocal sounding method, transceivers, complex signals.

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