

LASER OPTICAL-TELEVISION ACTIVE-PULSE UNDERWATER VISION SYSTEM

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The article is devoted to the practical application of the active-pulse observation method to provide underwater vision in conditions of diffusing seawater. The laser optical-television active-pulse underwater vision system (APS UV) developed for the implementation of this method, based on synchronized pulsed laser illumination of objects of observation and video recording by a specially developed optical-television camera based on a highly efficient photodetector module with a sensitive structure «Third+ Generation Image Intensifier Tube with extended blue-green spectral region – Digital CMOS-matrix», provides the formation of video images of underwater objects in seawater with the determination of the range to them.

A laser optical-television active-pulse underwater vision system (AIS PV) developed for the implementation of this method, based on synchronized pulsed laser illumination of underwater observation objects and video recording by a specially developed optical-television camera based on a highly efficient photodetector module with a sensitive structure «III+ generation electron-optical converter by – digital CMOS matrix», which provides the formation of video images of underwater objects in seawater with the determination of the range to them.

The article provides information on the physical prerequisites for the technical implementation of underwater vision in scattering seawater, as well as information on technical solutions for creating key elements of APS UV that can increase the range of vision by cutting off back scattering interference when observing in seawater. This advantage distinguishes APS UV from conventional optical television systems, in which back scattering is superimposed on the resulting image of the object, significantly reducing the range of vision and the quality of the resulting image.

The results of the work performed are aimed at increasing the contrast of the image of the observed underwater object and, consequently, the range of vision of the APS UV.

The article describes the developed model of the APS UV.

Keywords: active-pulse system, image intensifier tube, photodetector module, pulsed laser, back scattering interference.

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