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IMPROVING THE ACCURACY OF MEASURING SEABED OBJECTS USING VIDEO IMAGES WITH A LASER SCALER

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To study the bottom micro relief, geological features of the soil, as well as the structure of benthic fauna communities, video filming of the bottom surface with the help of towed, autonomous and remotely controlled vehicles is widely used. To determine the quantitative characteristics of the studied sea bottom areas, it is necessary to be able to carry out measurements based on the obtained images. One of the common methods for measuring objects on the bottom surface is to compare the size of the object in the image with a scale bar formed by projections of two or more laser pointers onto the bottom surface. This method shows good results when the bottom area is fairly flat. However, even in this case, the measurement error is affected by two types of image distortions: lens and porthole distortion and perspective distortions associated with the tilt of the image plane relative to the bottom plane. In this paper, the influence of distortions on the results of objects measurements on the bottom surface is studied, and a perspective correction method is proposed that allows one to align the bottom plane relative to the image plane. On the example of video recordings obtained with the towed vehicle "Videomodule", the effectiveness of the proposed method is shown.

Keywords: underwater video systems, sea bottom surveys, perspective correction, measurement error.

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