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Tilt Compensated Mechanical Measurement Mechanism for Very Shallow Water USV Bathymetry

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Abstract

Currently researchers are advancing unmanned surface vehicle (USV) for bathymetry and hydrography applications. The idea of USV was introduced to avoid the risk and danger of personnel on the water terrain. When it comes to shallow water bathymetry mapping most method has the limitation to measure terrain which less than 1 meter deep. Commonly USV uses sonar depth sensor to measure the water depth yet it has a minimum range which it can measure. In this paper, the USV has been equipped with an additional mechanical bar measurer to be used on the very shallow part of the water bodies. By lowering and measuring the angle of the bar respect to the boat's draft, the depth of the very shallow water can be obtained. The cases of the rocking of the boat are also being considered by measuring the roll and pitch and implement forward kinematic method for depth correction.

Keywords

Author Keywords: autonomous surface vehicle; unmanned surface vehicle; bathymetry; very shallow water; forward kinematic

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