Investigation of Attitude Sensors for Hydrographic Applications –GNSS, Motion Sensor and Low Cost Sensors

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SUMMARY

The use of attitude determining sensors (heading, roll, pitch) plays an important role in modern hydrographic survey environments. For example multi beam technology for depth measurements requires a high accuracy which can be fulfilled by inertial measurement units and GNSS systems. The measurements have to be proved regarding to quality aspects in hydrographic projects. Properly working and well calibrated instruments in a modern environment lead to economic benefits for customer and provider. The presentation shows the use and investigation of GNSS, motion sensor and low cost sensor on board the survey launch Level-A of the HafenCity University Hamburg (HCU) and on a river passage of a nearly 300 m overall length cruise ship. In terms of the project it could be proven that one motion sensor did not work properly –although calibrated in laboratory- and has to be exchanged. Some effects of not properly working motion sensors in multi beam environment will be shown. New technologies lead to new concepts of motion sensors in smaller size and weight. Low budget priced systems (2.000 $) consisting of three accelerometers, fiber optical gyros and magnetic devices serve for attitude determination. The low cots motion sensor XSENS MTi will be compared to GNSS and an accurate working motion sensor. It will be shown that the use of such a system in hydrographic application is possible, but limited.

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