

Maneuverability and Handling of the Penguin-Shaped Autonomous Underwater Vehicle (AUV) PreToS, Analytical and Experimental Results

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Research ship operating time for deep sea experiments is rare and expensive. Therefore, long endurance and short maintenance periods for AUVs are required. The AUV's hull shape is critical for endurance, flow characteristics, maneuverability and operation of the vehicle. This talk deals with the impact of a novel, innovative and hydrodynamic penguin-shaped hull on mobility and handling of an AUV.

Comparisons with common hull forms will be drawn using calculated CFD data. Tests in the Baltic Sea and the Atlantic Ocean were successfully performed with the AUV PreToS (Pressure Tolerant System) which was specifically designed to obtain low flow resistance and high maneuverability. The AUV PreToS has a depth rating of 6,000 meters. Course tracking results gained during these tests will be presented.

Moreover, a new propulsion unit will be introduced. A specific feature of this unit is a rudder which is located behind the vehicle's two counter-rotating main propellers, thereby providing higher lateral forces. The rudder itself has a modern high performance profile to gain best hydrodynamic results and high rudder forces.

At rough sea, it is difficult to launch and recover an AUV. To challenge these issues, a specifically designed Launch and Recovery System (LARS) has been built. The LARS will be presented and explained. Testing results and experiences will be provided and discussed within this talk.

