Wave Glider Autonomous Surface Vehicle Applications and Missions

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Abstract
Rising costs of ship time and increasing budgetary restrictions makes collection of oceanographic data a financial and logistical challenge. To address these challenges, Liquid Robotics (LRI) has developed the Wave Glider, an autonomous, mobile remote sensing solution. The Wave Glider is a hybrid sea-surface and underwater vehicle comprising a submerged “glider” tethered to a surface float. The vehicle is propelled by the conversion of ocean wave energy into forward thrust, independent of wave direction. The wave energy propulsion system is purely mechanical; electrical power is neither generated nor consumed by the propulsion mechanism. There is substantial power available in ocean waves, and the Wave Glider harnesses this power to maintain an average forward speed of about 1m/s (1.5 knots) in seas with 0.5m - 1m wave height. The system uses solar panels and 650 Watt hours of battery capacity to power on board sensors and payloads. This new class of wave-propelled, persistent ocean vehicle employs a multipatented design to allows cost-effective collection and transmission of data gathered during yearlong missions, over distances of thousands of miles, or while holding station. This talk will focus on the Wave Glider technology along with a number of field trials including active acoustics (fisheries echosounder and ADCP), METOC data collection in tropical storm conditions, and tagged shark monitoring.