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## Smart Automated Remote Ocean Wave Datalogger

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**Title:** Smart Automated Remote Ocean-wave Datalogger

**Abstract:**

A major barrier for conducting research in the field of renewable wave energy harvesting is to test the energy harvesting devices under real world ocean wave characteristics where they need to be deployed. It is highly expensive to test a device in the ocean and therefore needs to be rigorously tested in a lab before deploying in the ocean. Such lab tests require to reproduce accurate wave characteristics. By capturing the ocean wave signatures using a remote datalogger and then programming a motion platform in the lab can solve this engineering challenge at a low cost. This will allow ocean wave energy harvesting device prototypes to be tested under actual ocean environment without requiring to go into the ocean. In this research project, we have developed a miniature, smart and automated data logging device that can gather and store ocean wave characteristics. The device can be kept on a boat or allowed to float on the ocean water surface for few days to capture the wave behavior. The battery-powered data logging circuit consists of a microcontroller, a digital accelerometer, an electronic gyroscope and magnetometer, a GPS chip and a micro-SD card module. The microcontroller is programmed to periodically wake up from deep sleep to check for a preprogrammed location. When the device reaches the desired location in the ocean, it automatically starts recording data without any human intervention. The data logger records the date, time, location, acceleration, and tilt angle. The recorded data can be downloaded to retrieve the ocean wave characteristics. Our developed device can also be applied to other fields of research, such as to sense incoming tsunami threats or monitor hazardous weather conditions in the ocean. We will present on the design, fabrication and initial lab test results of the developed smart wave datalogger.