UNIVERSITY OF PUERTO RICO AT MAYAGÜEZ

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DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

CAG

A PROJECT PROPOSAL SUBMITTED AS A PARTIAL REQUIREMENT OF THE COMPUTER ENGINEERING PROJECT DESIGN COURSE ICOM-5047

by

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Abstract

Wave post-breaking dynamics is a phenomenon that is not yet well understood. This article proposes a series of improvements for a device that is used to measure variables that are essential to the physics of wave breaking. The aforementioned device is a spherical drifter with a diameter of 7.5cm designed to closely imitate the dynamics of a particle in the water. It will be equipped with a 3-axis accelerometer, gyroscope and magnetometer, allowing the sphere to measure its motion to 9 degrees of freedom. This will allow the researchers to reconstruct the device trajectory in the wave via dead reckoning. A GPS module, on-board flash memory for data storage and a wireless communication module for data retrieval will also be integrated into the spheres in order to solve various problems currently faced by researchers in this area. It is expected that, when used in synergy, multiple units will be able to greatly help researchers understand the dynamics of wave breaking.

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