

TNA PROJECT REPORT

1. Project Information

Proposal reference number	JN-CALL 1_10
Project Acronym (ID)	ANTEIA
Title of the project	ANTEIA directional wave measuring sensor validation
Host Research Infrastructure	Galway Bay Data Buoy (SMARTBUOY)
Starting date - End date	27/07/2018 – 23/01/2019
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User group members	Ibone Rodriguez de Pablo, Adolfo García ZUNIBAL, S.L., Spain

2. Project objectives

The main objectives of the project is the validation of the technology developed by ZUNIBAL through a deployment and data comparison between ANTEIA Wave Buoy and WAVERIDER from Datawell.

As the ANTEIA Wave Buoy System is based in novel GPS technology for measure motions, it has to be validated with the existing wave measurement buoys that use inertial systems to monitor the wave measurements. It is also relevant to have this comparison because of the materials and size of ANTEIA Wave Buoy, which is smaller and made of lighter plastic materials that give the advantage of an easy deployment and maintenance without losing accuracy in the measurements.

3. Main achievements and difficulties encountered

The main achievements during the period of the project are the mooring design for Galway Bay in the location given by Smartbay, the adaptation of the software configuration for making measurements, deployment, monitoring and retrieval of the system and data analysis and comparison.

All the stages of the project have been successfully committed with a global result of complete validation of ANTEIA Wave Buoy and obtaining a document that describes the techniques used for the measurements, the comparison with WAVERIDER and the results of the experiment regarding accuracy, conformance to the goals of the product and repeatability of measurements.

We have not encountered any difficulty despite finally the deployment and retrieval had been remotely.



4. Dissemination of the results

The results of the project have been included internally in a dossier that we are going to use in different exhibitions to show the accuracy of ANTEIA Wave Buoy vs. WAVERIDER..

It has been published a communication on the Ocean Energy Ireland website where it has been shown a data comparison figure of both buoys. (<http://news.oceanenergyireland.com/smartbay-marine-and-renewable-energy-test-site-activities>).

5. Technical and Scientific preliminary Outcomes

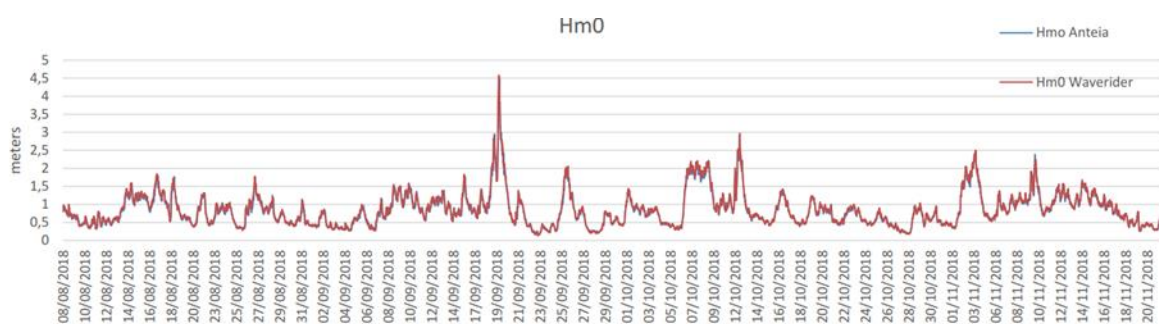
The main objective of this project, was to test ANTEIA Wave Buoy, in Galway Bay. This area, has different sea states that makes a good scenario to test in.

Galway Bay, has a depth about 20 meters, and calm sea states during most of the time. Some storms has appeared during the testing period, and has make a complete type of sea states. Apart from that Galway Bay owns a WAVERIDER buoy, which is a reference in wave measurement, and allow us to have the reference in data obtained.

ANTEIA Wave Buoy was deployed in Galway Bay, at August, until January. The installation maneuver was managed by Marine Institute. ANTEIA's installation, was made by a vessel with a crane. The mooring line was connected to the buoy and to the clamp weight. The procedure consists on download the clamp weight up to the sea bed (around 20m), and automatically the buoy goes to the working position.

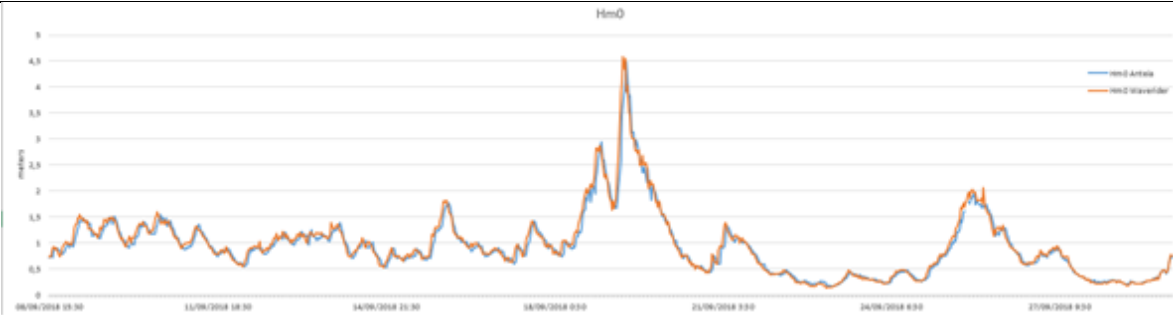
At this moment ANTEIA started to get sea measurements, and were transmitted to the servers by GSM. Apart from oceanographic data, the buoy transmits GPS position, to check if it is in the correct position.

Wave information were divided into time domain data, and frequency domain data. The data from ANTEIA is shown in contrast with WAVERIDER data:

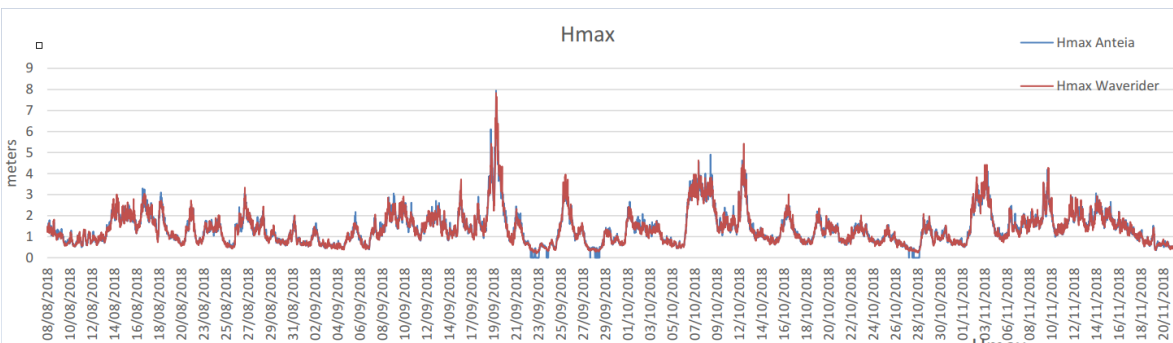


In this plot, Hm0 is shown. ANTEIA buoy has been working in different sea states between 0.5m and 4.5m of Hm0. With this different sea states, it has been possible to test the system in most relevant sea states.

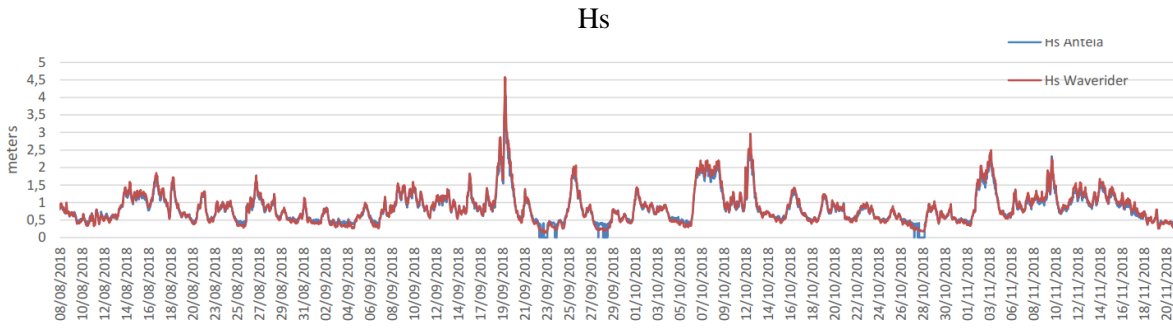
In this plot, there is a zoom of a storm, where an Hm0 of 4.5m were recorded:



The correlation between both buoys, has reached 97,63%



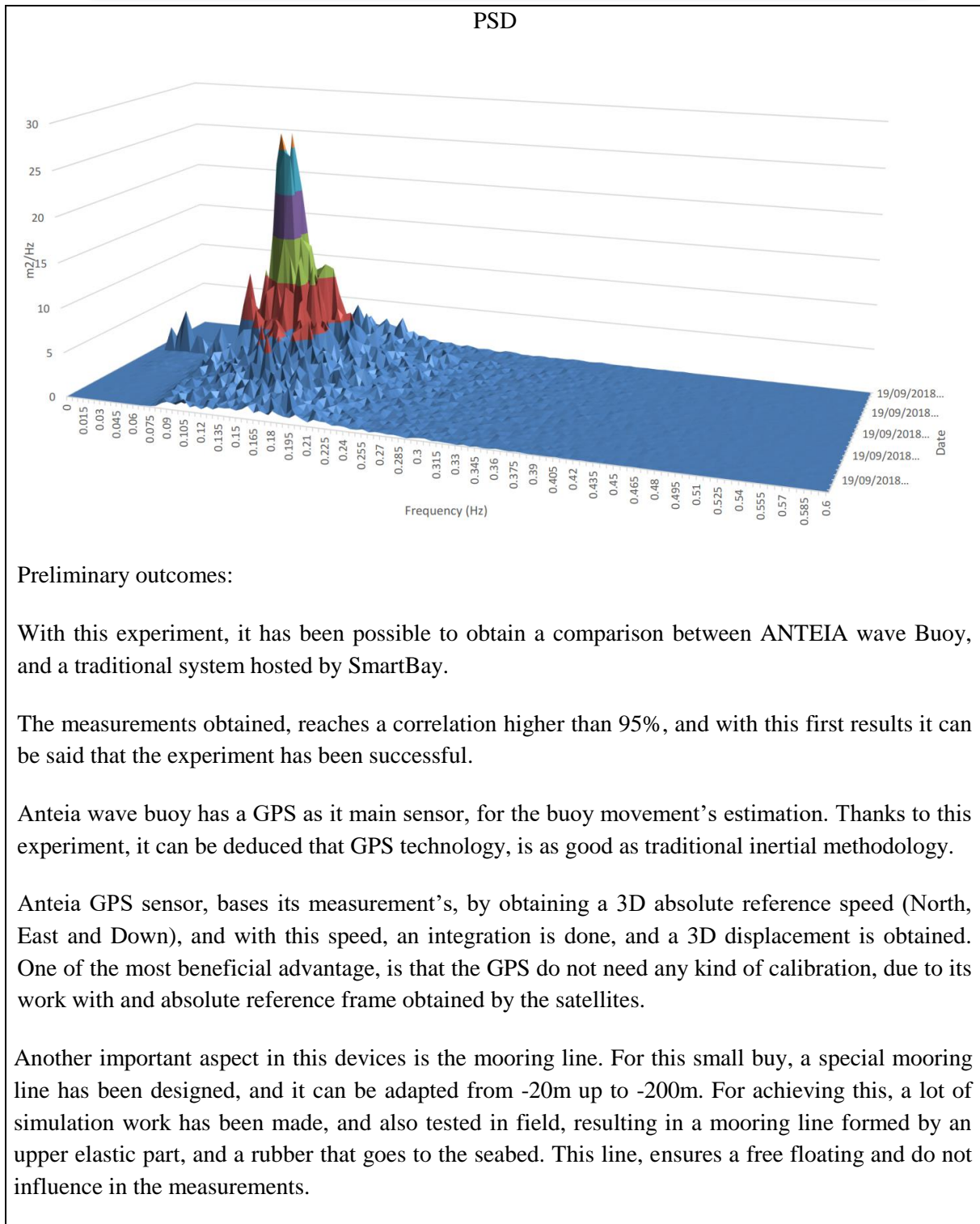
This plot shows a Hmax of 8m that was recorded during “Ali storm”. The correlation between both buoys reaches 92.84%.



This plot shows Hs (time domain). There are some “0” values because ANTEIA buoy has a cut off filter tuned at 15cm, what means, that a wave below 15 cm is not considered as a wave.

The correlation between both buys reaches 99.32%

Finally a non-directional spectrum (PSD) is shown. This data has been obtained directly from the buoy without any computation.



SUBMITTED, 27 FEBRUARY 2019; FINAL REVISION, 2 SEPTEMBER 2019