DEVELOPMENT OF A SIMPLIFIED PROTOTYPE FOR WAVE GENERATION USING ARDUINO

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INTRODUCTION

This paper focus in the development of a simplified prototype for wave generation using Arduino. The main objective of is the development of a simplified model of an experimental environment composed of a wave generator, a response pickup sensor and an energy dissipation mechanism, using the Arduino electronic prototyping platform. The final result of the project is a simplified model able to reproduce behaviors of offshore environments for didactic purposes. The system will be used in the Laboratory of Platforms and Automation of the Federal University of Alagoas, being able to constantly evolve and open doors for new projects.

OBJECTIVES

- Develop an experimental environment for wave generation;
- Build and calibrate the system, collecting data;
- Validate the system through analysis of the data collected.

METHODOLOGY

The development of the test environment was divided into three macro steps, as described in Figure 1:

Development of an Experimental Environment
- Study of wave generation methods;
- Geting and crafting the required components;
- Assembly of the tank.

Building and Calibration of the System
- Calibration of the wave genarator and energy dissipator;
- Gathering of dataa.

Validation
- Analysis of the collected data.

Figure 1 – Macro steps of the project

RESULTS

The results are described in the following Figures and Table:

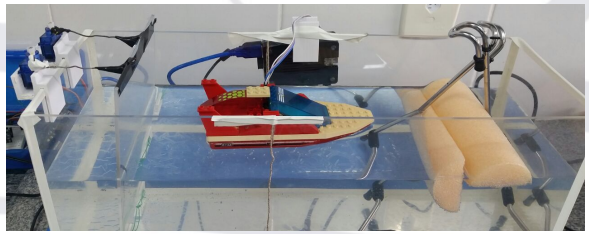

Figure 2 – Test tank during operation

Table 1– Gathered data

Input Frequency	Measured Frequency	Average Aceleration (m/s²)
0,5 Hz	1,3 Hz	0,066
0,7 Hz	1,45 Hz	0,077
1 Hz	1,5 Hz	0,069
1,5 Hz	1,6 Hz	0,102
2,5 Hz	2 Hz	0,126

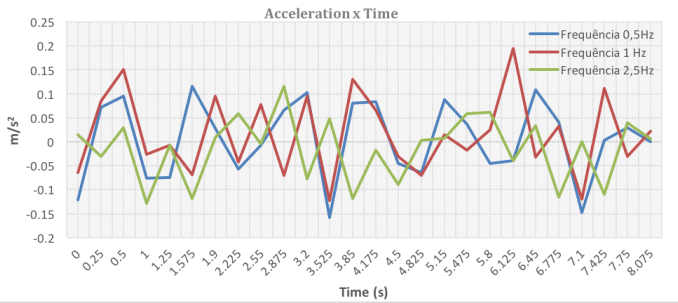

Figure 3 – Acceleration x Time

Conclusion

The objectives proposed in this paper were achieved by developing a test tank capable of generating waves and enabling the acquisition of data. Due to the academic nature of the project, It will be improved from the data and results obtained in the work, being able to constantly evolve and be used for the most diverse educational purposes