

# OPTIMIZATION OF POINT ABSORBER DESIGN IN OCEAN WAVE ENERGY CONVERSION

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The purpose of this study is to analyze the factors that affect the efficiency of a wave energy conversion device and design an optimal point absorber float geometry considering the various factors. Factors to be analyzed in the study include damping system design, resonance, float geometry, and the kinematics of the device. This study will utilize Fusion 360<sup>1</sup>, Nemoh<sup>2</sup>, and Wec-Sim<sup>3</sup> to achieve the objectives. Fusion 360 will be used to design point absorber float geometries. Nemoh will be used to simulate the hydrodynamic response of each float design. Wec-Sim will be used to vary the wave conditions and calculate the efficiencies of the various designs based off of the response generated in Nemoh. From this, trends will be observed and an optimal geometry can be determined. The results of this study can be used to further optimize point absorber systems and provide solutions to minimize the difficulty of extracting energy from ocean waves.

## ACKNOWLEDGEMENTS

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## REFERENCES

<sup>1</sup>Autodesk Inc. (2017). Fusion 360. Retrieved from <http://www.autodesk.com/products/fusion360/overview>

<sup>2</sup>Le Laboratoire d'Hydrodynamique, Énergétique, et Environnement Atmosphérique. (2016). Nemoh. Retrieved from <http://lheea.ec-nantes.fr/doku.php/emo/nemoh/start>

<sup>3</sup>National Renewable Energy Laboratory, Sandia Corporation. (2015). WEC-Sim (Wave Energy Converter Simulator). Retrieved from <https://wec-sim.github.io/WEC-Sim/>