Buoy Wave Energy Converters Capture of Ocean Wave Energy

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The purpose of this project was to test how the correlation between how the amplitude of the waves affected the amount of electricity the buoy wave energy was able to produce. I hypothesize that when the amplitude of the wave was the same as the height of the piston of the wave energy converter it would produce its maximum amount of electricity until the amplitude of the wave was greater than the length of the piston. At this point, the electricity produced would fall. The experiment involved placing the model buoy wave energy converter in the wave tank and generating waves of different amplitudes. The wave plate was moved back and forth based on the consistent rhythm of a metronome. The speed of the metronome was used as the constant variable and allowed the frequency of the waves to be consistent. The height of the wave was the independent variable. A galvanometer was used to measure the energy generated from each wave. The data collection did support the original hypothesis. The findings showed the maximum electricity was produced when the height of the piston was the same as the amplitude of the wave. The amount of energy generated increased with each interval up until the wave height was 3.2 centimeters which was the height of the piston of the model wave energy converter. At this point, the energy produced peaked, and at every interval afterward, the energy decreased because the waves were too rough from the model wave energy converter to effectively produce electricity.

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