OPTIMIZING WECS FOR CANADIAN WATERS

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An example Wave Energy Converter (WEC) is being used for this work to demonstrate the

Table 1: Representative wave resource for the West Coast of Canada.

Since the PTO is a hydraulic system, it is modeled as a columbic damper: it has a constant force that opposes its velocity.

The hydrostatic force is based on the submerged

Table 3: The representative power for Wave Hub, South East of England.

Simulated Wave Climate

The wave spectrum used in this work is the JONSWAP spectrum. The number of waves used depends upon the peak frequency and is set so that the repeat period of the sea-state is approximately equal to the simulation length. The waves have a cosine exponential spreading function [2] and the primary direction is perpendicular to the length of the pontoon. The phases of the waves were randomly assigned for each sea-state, and kept the same for each time that sea-state was tested.

2.4. Optimization

Width calculation

The mooring force that the WEC experiences, in this work, is deemed to be an important constraint. Increasing the capability of the system to cope with larger mooring forces would involve higher costs to ensure survivability and reliable operation.

For a set length, the width is calculated that results in the mooring force reaching a

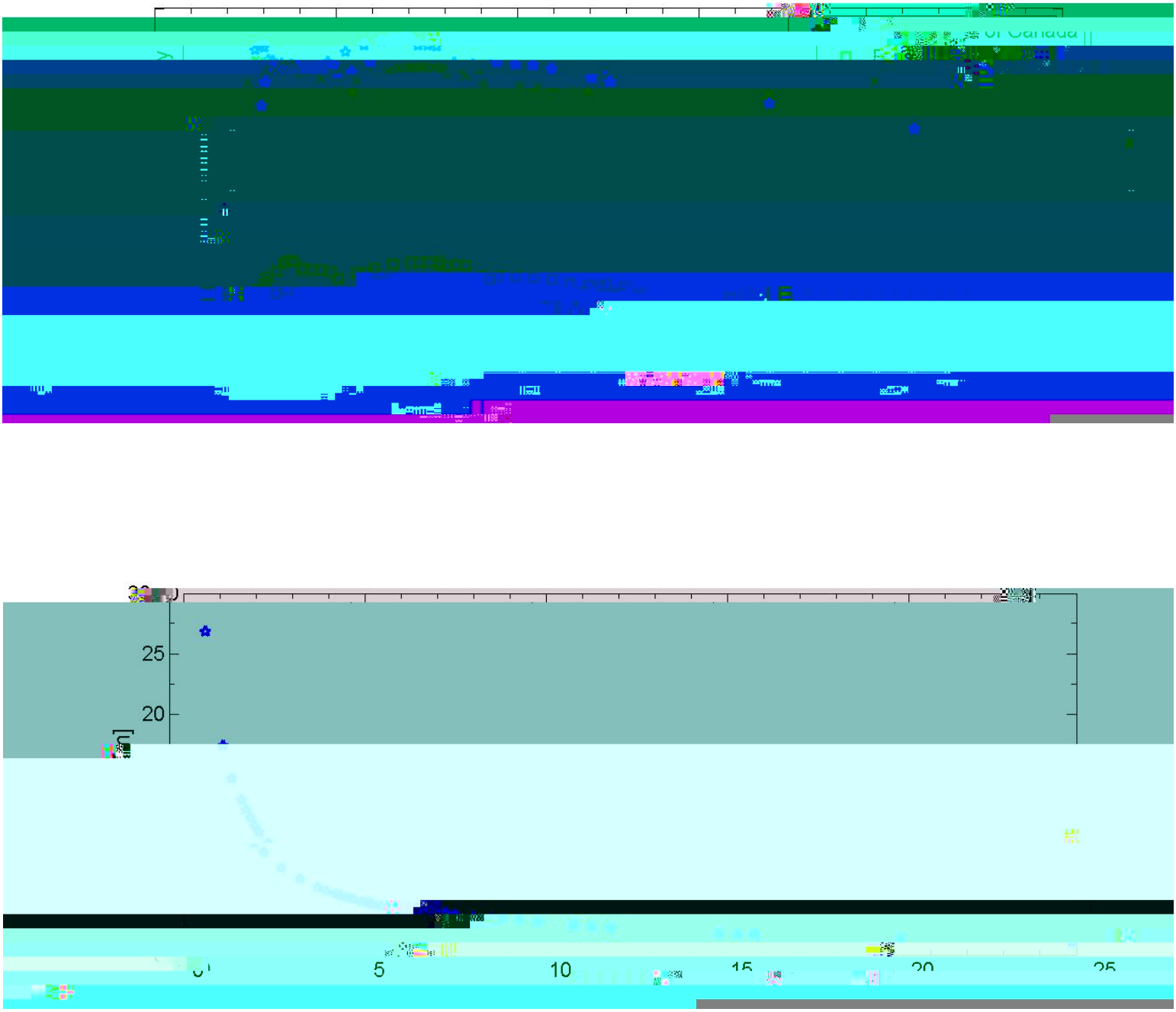

Figure 3: The relationship between the length and width of the pontoon