

Research Project

Mid-stage Development of the CCell Wave Energy Converter



Motivation

In recent years, Wave Energy has emerged as an exciting research area due to increased interest in Renewables and better funding. In an attempt to make wave power economically competitive, Zyba Renewables Ltd. is collaborating with the University of Bath to develop the CCell, a highly efficient oscillating wave surge converter. The novel curved design of the device is expected to offer substantial benefits in power extraction and structural strength compared to conventional flat paddles. The overall aim of the project is to develop the prototype device and prepare it for commercial deployment in the near future.

Challenge

The amount of power captured from ocean waves is highly dependent on the optimisation of the Power Take-Off (PTO) system. A poorly tuned PTO will capture little power and could increase loading and wear on components. A balance must be struck between power capture and degradation, and this is very difficult to achieve in the highly variable marine environment.

Research Aims

The major aim of this research is to develop advanced proactive control algorithms to optimise operation of the CCell paddle as an individual unit, and also as part of a cooperative array. The work is a mix of analytical modelling, computer simulations, and experimentation on dry and wet rigs.

Future work

PTO systems for several prototype CCell devices are currently being developed for deployment in laboratory and open-sea conditions. These will form a test bed to for a variety of control strategies.

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