

Biography and Application

Biography

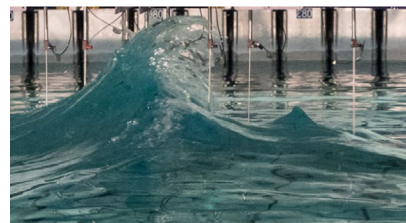
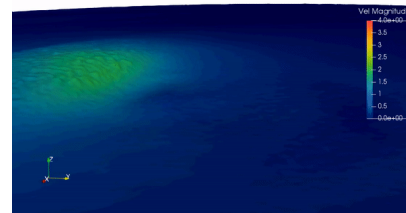
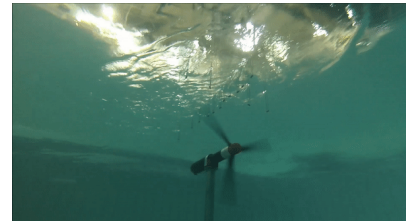
Sam Draycott

Dame Kathleen Ollerenshaw Fellow
The University of Manchester
June 2019 – present



Research interests

- Physical model testing
- Wave-current interaction
- Ocean measurement and characterisation
- Numerical and physical modelling of rogue waves



ECR fund application

Directionally Spread Surface Wavepackets subject to an Abrupt Depth Transition (ADT)

Experimental tests

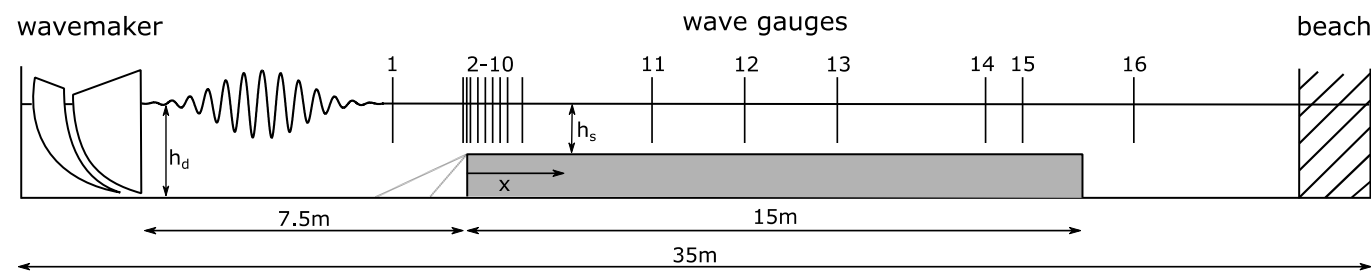
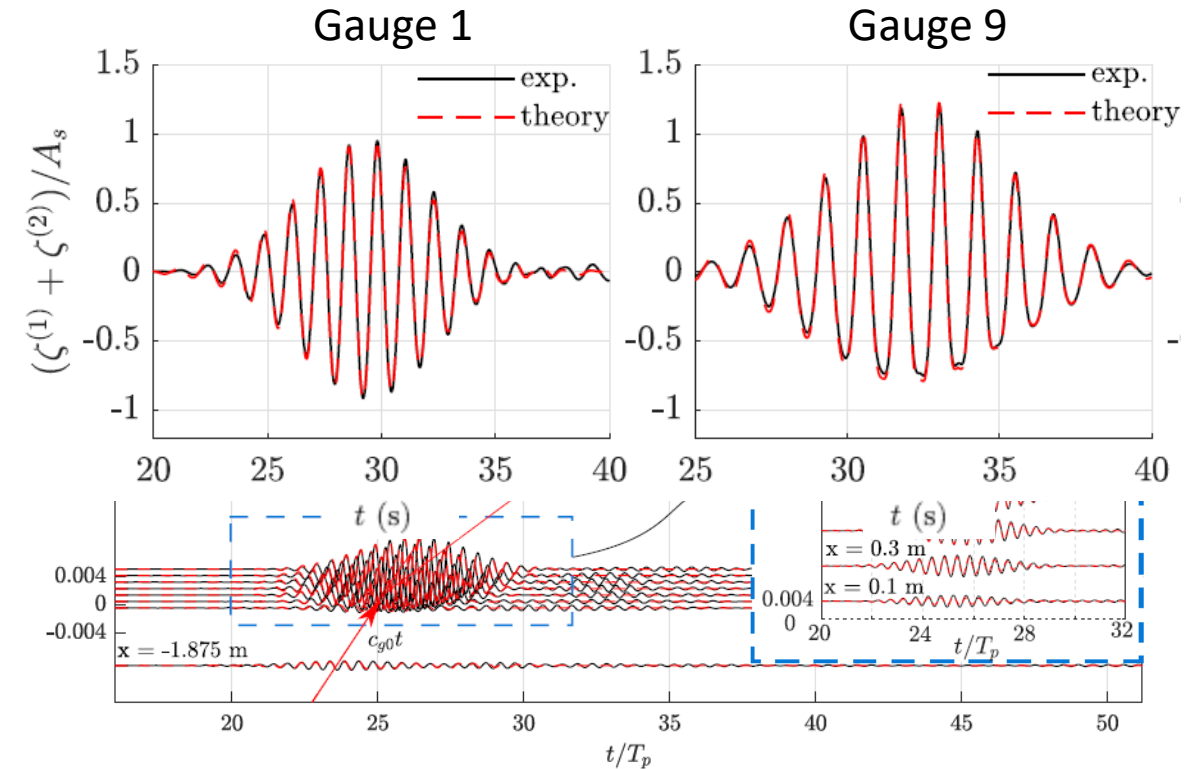
- Extension to UK-China flex fund (2D to 3D)
 - PI: Yan Li at University of Oxford
- Funding for materials + construction
- Chance to lead first experimental campaign at University of Manchester facilities



Project Overview

Background

- Rogue waves can occur due to Abrupt Depth Transitions (ADTs)
 - **The mechanism for this was unknown**
- Through experiments and theory it was concluded that:
 - Free superharmonic waves (2nd order) generated at the step
 - Superposition of free and bound superharmonic waves induce rogue waves
- Experiments included
 - Regular waves
 - Focused waves
 - Long-run irregular waves



Project Overview

Aims

- Want to extend understanding to directionally spread waves (2D to 3D)
 - Real seas are directionally spread
- Experimentally quantify relative crest amplification as a function of:
 - Directional spreading
 - Depth ratio
 - Relative depth and steepness (kd and ka)
- Develop and validate extended theory
 - Collaboration with Yan Li at Oxford/NTNU

Plan

- Design and build stepped seabed
 - 0.2 m x 5 m x 12 m
- Test plan
 - Directionally spread focused wave groups
 - Irregular waves?
- High density array of wave gauges
 - Repeats to map out large spatial area (x, y)

