

Self-sensory carbon fibre textile-reinforced concrete for offshore floating foundations

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Opportunities of concrete floating platforms

- Significant cost reduction
- Local supply
- Mature technologies
- Better carbon footprint and cost stability

Challenges of concrete floating structures

- Water tightness
- Corrosion of steel reinforcements
- Fatigue failure mechanism

Why carbon-fibre textile reinforced concretes

- Corrosion resistant
- Flexible at connections
- Better bond than FRP rebars
- Self-sensory capabilities

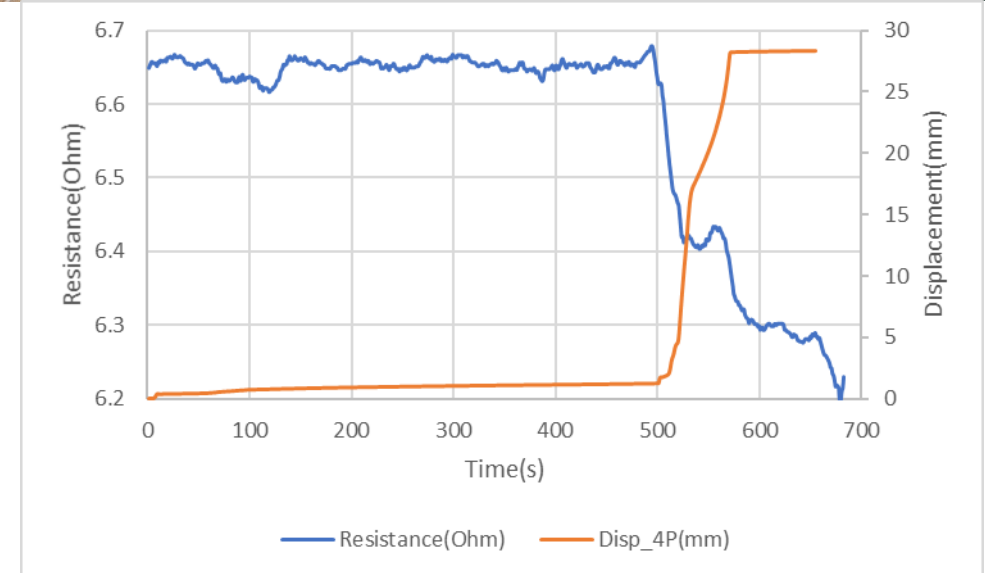
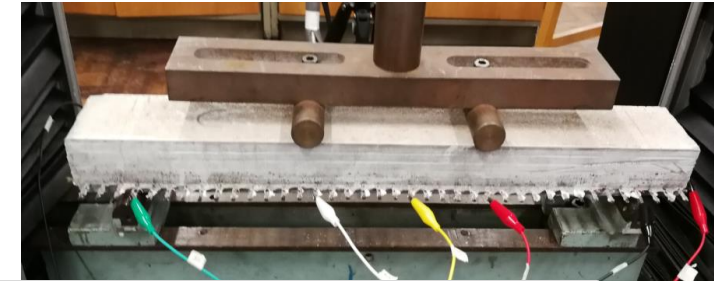
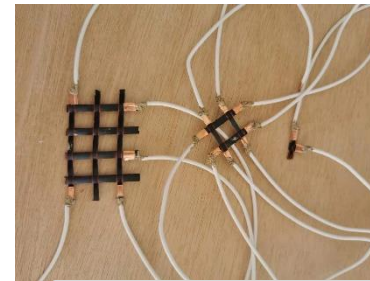
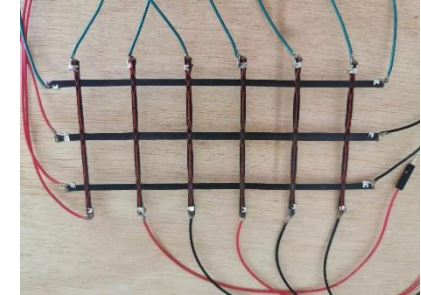
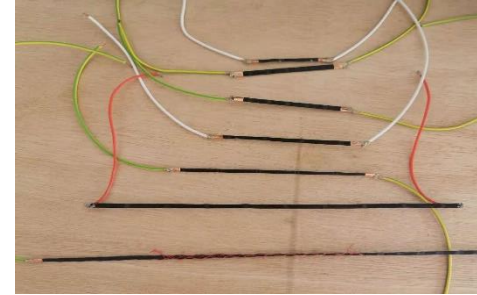


Research method

- Make use of the connection resistance in the mesh
- measuring the electro-mechanical response using multiple channels simultaneously to plot the current flow patterns in the structure

Results and Conclusions

- Carbon fibre tow, end point connection resistance, and mesh connection resistance are at different magnitudes
- Carbon fibre mesh resistance responds differently to different load locations
- Voltage change can capture the crack initiation of the TRC
- More work is needed to correlate the voltage change to the strain.



Resistance decreased when crack initiated.

Maximum reduction was approximate 5% of initial value.

