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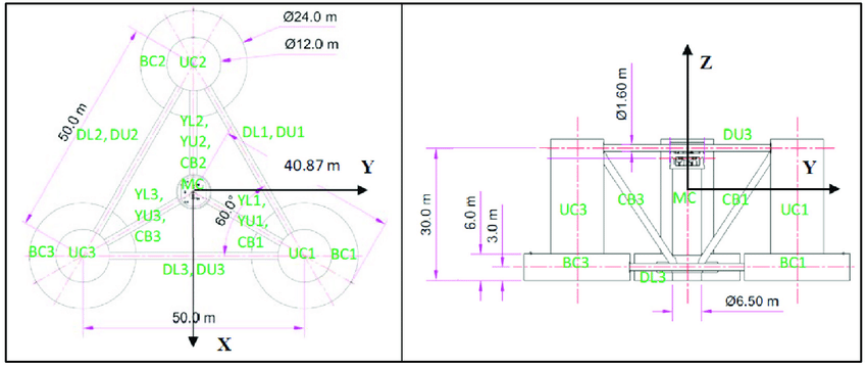
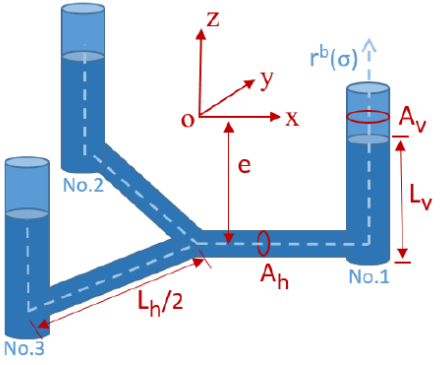
Design of TLMCDs - An Example





Tuned liquid multi-column damper (TLMCD)[1,2]

$$\omega = \sqrt{\frac{2 * g}{L_h * \frac{A_v}{A_h} + 2L_v}} = \sqrt{\frac{2 * 9.81}{28.86 * 2 * \frac{A_v}{A_h} + 2L_v}}$$

DeepCwind Semi-submersible floater

- Pitch resonance of Semi-sub: around ***18s***
- Final selection of A_v/A_h=2.73 with L_v = 8m,
- R_v=2.47m, R_h=1.5m (based on the Semi-sub configuration)

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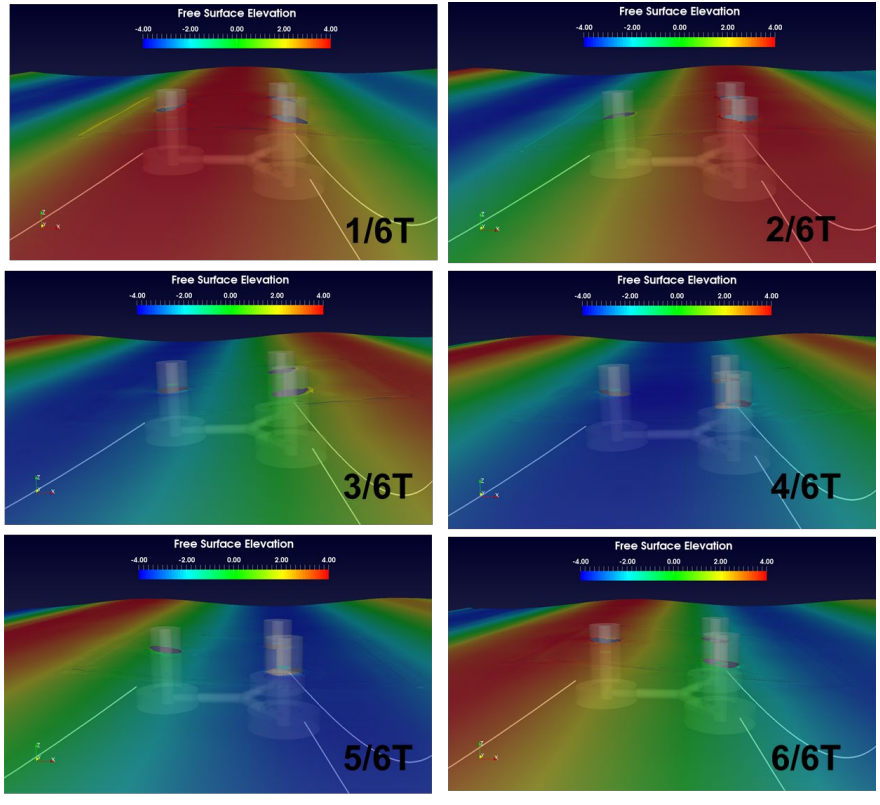
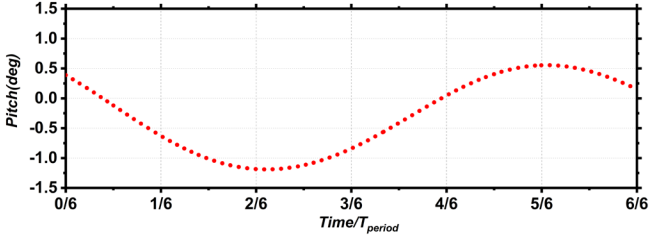
Dynamic Response of the floater





- Contours of free surface elevation at one sample wave period from 84s to 96s
- The free surface elevation of TLMCD in phase with the pitch response
  - If the floater reaches the ***maximum*** pitch, then the water level at ***larboard/starboard column*** will be higher
  - If the floater reaches the minimum pitch, the water level at upstream column will be higher