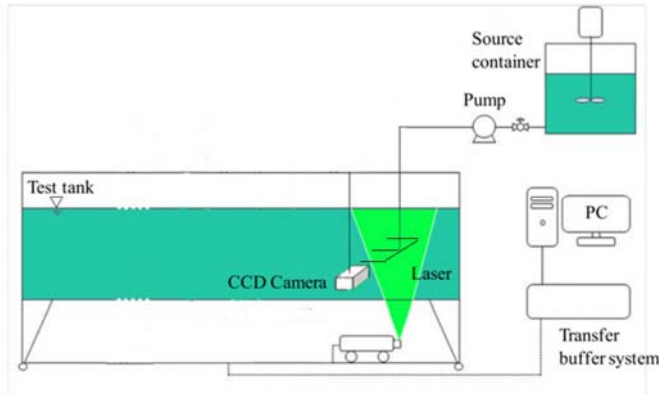


Study on Multi-port Jets in Shallow Water

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Background

- ❑ Submerged outfall in shallow water is becoming more and more common in the newly-built coastal facilities due to cost effective
- ❑ Shallow water is not favorable to buoyant effluent as the jet will easily touch the water surface or seabed, which may affect the dilution performance



Experimental setup



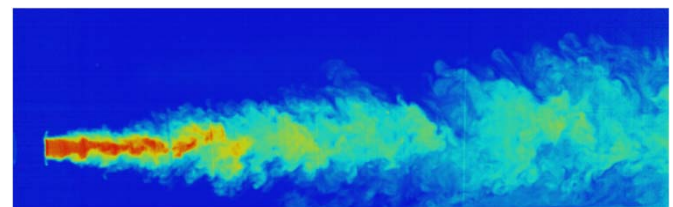
Submerged marine outfall

Methodology

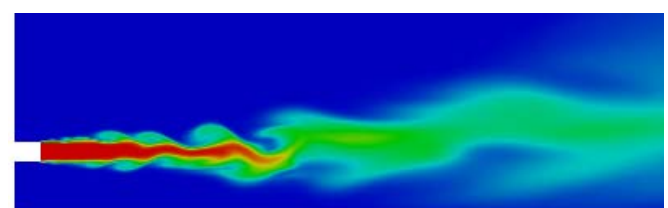
- Laboratory experiments: Concentration field measurements by planar laser induced fluorescence (PLIF)
- CFD simulations: Large eddy simulation (LES) with Smagorinsky SGS model by OpenFOAM

Conclusions

- ✓ The dilution of multi-port jets in shallow water are constrained by the existence of seabed and water surface
- ✓ Overall, the CFD predictions on the jet in shallow water are satisfactory: the trajectory matches very well while the dilution is slightly underestimated by 10-20%



Experimental result on concentration contour



CFD prediction on concentration contour