

Mixing Behaviors of Inclined Dense Jets In Flowing Currents

➤ Seawater desalination, especially seawater reverse osmosis (SWRO), is becoming popular as an alternative portable water supplement for expanding coastal cities around the world. A byproduct from desalination plants, known as desalination brine, is typically discharged directly back to the sea.

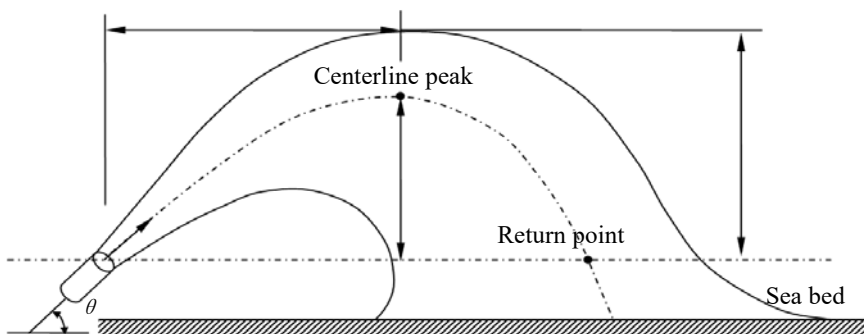


Figure 1: Schematic side view of an inclined dense jet

➤ The brine mixes with the ambient water initially as a negatively buoyant jet upon discharge (Figure 1), then falls and impacts onto the seabed due to its negative buoyancy.

➤ To minimize the potential environmental impacts, the brine needs to be mixed well with the ambient water within the mixing zone.

➤ The mixing behaviors of inclined dense jets can be affected by ambient currents. Therefore, the concentration and velocity fields of the inclined dense jets are investigated by Planar Laser Induced Fluorescence (PLIF) and Particle Image Velocimetry (PIV) techniques (Figures 2 and 3).

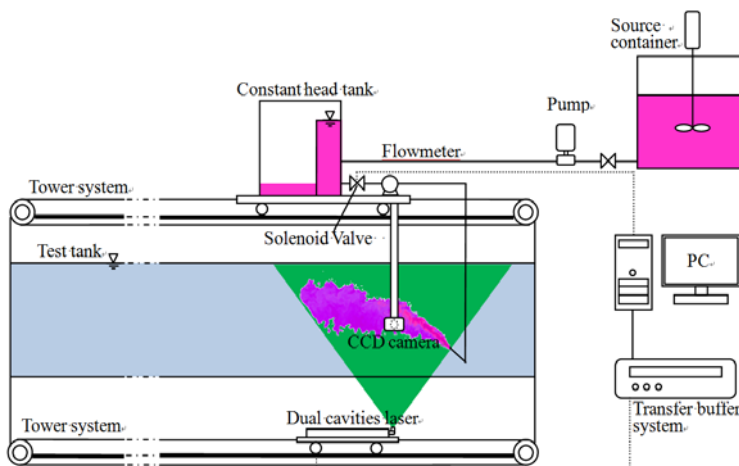


Figure 2: Experimental set up

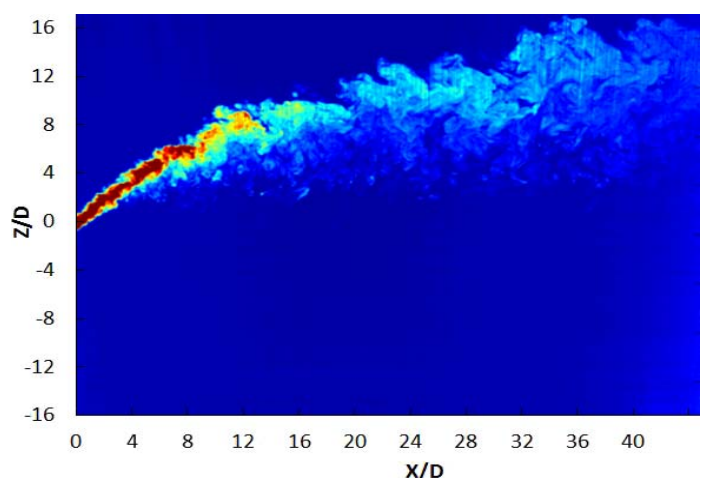


Figure 3: Instantaneous concentration contours of dense in co-flowing currents (PLIF)