

COHERENT STRUCTURES IN RECTANGULAR SURFACE JETS

Background

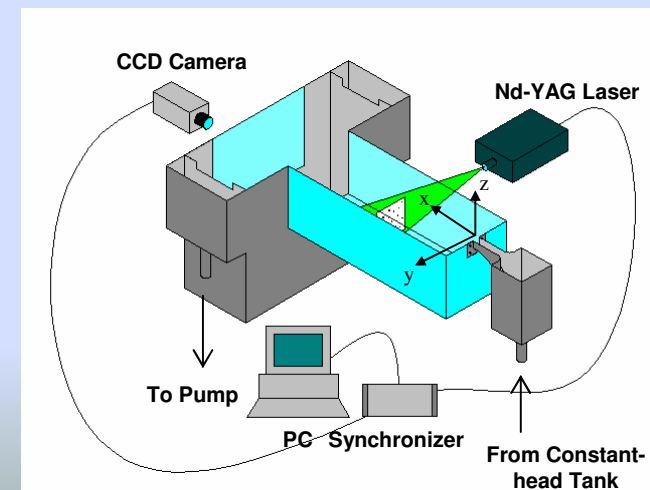
Surface jets are seen in many engineering applications, such as discharge of pollutants into rivers, lakes, and oceans. Mixing and transport of scalars are governed by jet characteristics.

Objective

To identify coherent structures in the flow using Proper Orthogonal Decomposition (POD) of data from the instantaneous jet flow field, measured using PIV.



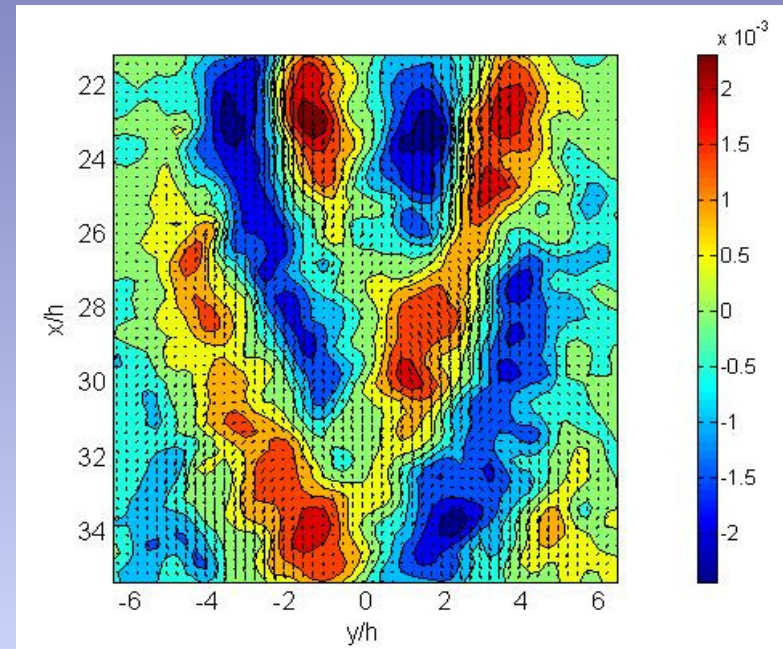
Thermal discharge from a power plant



Experimental set up

Research Carried Out

PIV measurements were carried out in vertical planes, normal to the jet axis, and in a horizontal plane at the surface. The instantaneous flow field obtained by PIV was analyzed using POD.

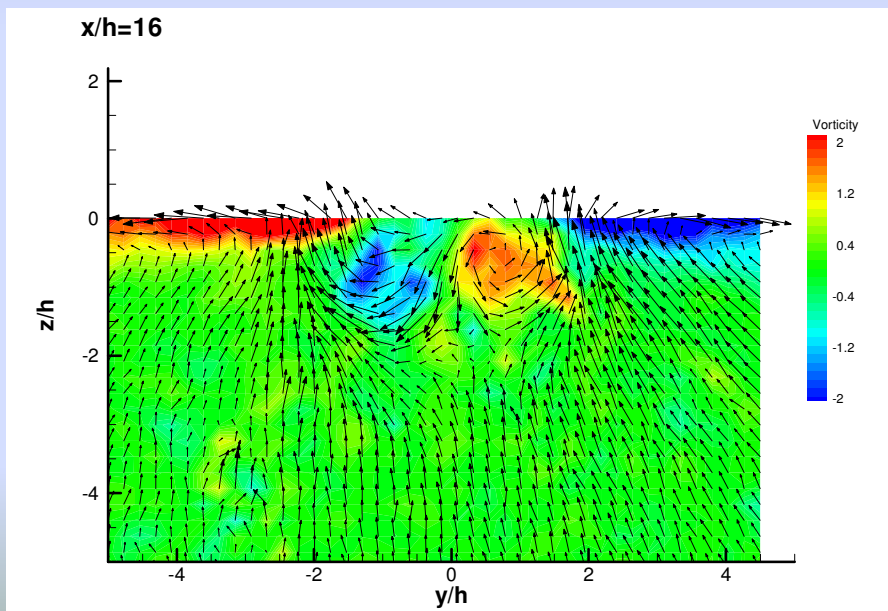


POD analysis of the surface velocity field

Key Findings

A pair of counter-rotating vortex structures were observed in the mean flow field of the development region. POD showed the footprints of these structures at the surface.

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PIV measurement of mean velocity field