



VORTEX SHEDDING CONTROL BEHIND SIDE BY SIDE CIRCULAR CYLINDERS WITH VERTICAL SPLITTER PLATE IN SHALLOW WATER

Mustafa Atakan Akar, Hüseyin Akıllı, Oğuz Baş, Engin Pınar and Beşir Şahin

Cukurova University, Turkey

Burcu Oguz

Mersin University, Turkey

In this paper, flow changes were observed via Particulate Image Velocimetry (PIV) technique in shallow water flow for two side by side circular cylinders which a vertically placed splitter plate (VSP) was placed between them. The circular cylinders made of acrylic material have a diameter of $D=40\text{mm}$. Throughout the experiments water height was $h_w=20\text{ mm}$ and flow images were taken at three different elevations: very close to the bottom surface ($h_L=2\text{ mm}$), mid-plane of water height ($h_L=10\text{ mm}$) and close to the free surface ($h_L=18\text{ mm}$). The free stream velocity was 125 mm/sec and Reynolds Number was $Re_D=5000$ based on diameters of circular cylinders. Five different VSPs varied from heights of $H=2\text{ mm}$ to 10 mm with an increment 2 mm were used to control unsteady flow. The gap/diameter ratio was $G/D=1.25$ for all cases. As a result, increment of splitter plate height is effective way to diminish turbulence characteristics in all elevations. However, after height of splitter plate is $H=6\text{mm}$, the effect of vertical splitter plate on vortex shedding control is not significantly changed.

Keywords: Vertical splitter plate, Flow control, Side by side cylinders, Shallow water.

Acknowledgements

The authors would like to express their gratitude to Cukurova University Scientific Research Project Coordination (FBA-2016-5832) for financial support.