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Effect of Channel Variation of Two-Dimensional Water Tunnel to Study Fluid Dynamics Phenomenon

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Abstract : Computational fluid dynamics (CFD) is the solution to explain how fluid dynamics behavior. In this work, we obtain the effect of channel width of two-dimensional fluid visualization. Using a horizontal water tunnel and flowing soap film, we got a visualization of continuous film that can be observe a graphical overview of the flow that occurs on a space or field in which the fluid flow. The horizontal water tunnel we used, divided into three parts, expansion area, parallel area that used to test the data, and contraction area. The width of channel is the boundary of parallel area with the originally width of 7.2 cm, and the variation of channel width we observed is about 1 cm and its times. To compute the velocity, vortex shedding, and other physical parameters of fluid, we used the cyclinder circular as an obstacle to create a von Karman vortex in fluid and analyzed that phenomenon by using Particle Imaging Velocimetry (PIV) method and comparing Reynolds number and Strouhal number from the visualization we got. More than width the channel, the film is more turbulent and have a separation zones that occurs of uncontinuous flowing fluid.

Keywords : flow visualization, width of channel, vortex, Reynolds number, Strouhal number
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