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HYDRAULICS

NON-UNIFORM FLOW IN OPEN CHANNEL EXERCISE

TOPIC 4.1

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Chapter 4: Dimensional Analysis and Hydraulic Similarity by N Adilah A A Ghani

Communitising Technology

Exercise 4.1

The Reynolds number is a very important parameter unit in fluid mechanics. Verify that the Reynolds number is dimensionless, using both FLT system and MLT system for basic dimensions.

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Exercise 4.2

It is desired to determine the wave height when wind blows across a lake. The wave height, H is assumed to be a function of the wind speed, V , the water density, ρ water, the air density, ρ_{air} , the water depth, d , the distance shore, l , and the acceleration of gravity, g . Use d , V and g as a repeating variables to determine a suitable set of pi terms that could be used to describe this problem.

Exercise 4.3

Water flows over a dam. Assume the flow rate, q , per unit length along the dam depends on the head, H , width, b , acceleration of gravity, g , fluid density, ρ and fluid viscosity, μ . Develop a suitable set of dimensionless parameter for this problem using b , g and ρ as repeating variables.