SEDIMENTATION CHARACTERISTICS STUDY ON THE CONFLUENCE OF TWO RIVERS USING MESHLESS LOCAL PETROV-GALERKIN METHOD AND FLUENT SIMULATION

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Abstract
The process of sedimentation that occurred in the river can cause shallowing of the river resulting in overflow of water to the surface. Sedimentation is a lot happening at the confluence of two rivers. Mathematical modeling using the Meshless Local Petrov-Galerkin (MLPG) is an alternative that can be used for this problem because it does not require mesh or grid to finished, so it is very helpful in moving issues such as sedimentation. Fluent as a software simulation of visual applications in the fluid is used to visualize sedimentation processes that occur at the confluence of two rivers.

From the results of numerical simulation with Matlab, for the flow of the bendstream, there is a decrease the height of the sediment ±0.002, an increase in speed of about 0.000848 during the initial velocity v=0.1. When the initial velocity v magnified it will also increase and decrease is the greater, can be seen at v = 0.9, a decrease in water depth of about 0.015832, and ±0.068586 increase in speed, and the height of sediment decreasd by approximately 0.166470. The amount of speed and depth affect the height of the sediment on the riverbed. Likewise, the height of the straight stream sediment increase ±2.792678, ±5,172373 decreased speed, the depth of the river is also down about 2.792678, for the first river debit and the second river debit are Q=0.5. When the first river and the second river are different,
and the first river debit is 0.3 while 0.9 for the second river debit, sediment remained ride height ±0.297025, ±1.651025 and speed up, as well as the depth is increased approximately 0.278835.

While fluent simulations show that the velocity of the river would have increased the speed on the bend of the river which could allow scouring on the bend river. At confluence, vector speed will increase and formatting vortex resulting from the convergence of two streams of different vector direction. Thus, large-small lateral flow velocity has a great influence on the water depth, flow velocity and height of sedimentation in the main river.

**Keyword : sedimentation, the confluence of two rivers, Meshless Local Petrov-Galerkin (MLPG), fluent.**