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Model name: TC-11_Rigid Vegetation_Test_Case

Objective: Use EFDC+ Explorer (EE) and EFDC+ to replicate the Pasche and Rouvé (1985) test cases for vegetation interactions in the flume described in the paper “3D numerical modeling of open-channel flow with submerged vegetation”. The goal is to better understand the impact of vegetation to the flow in open channel.

Model grid: 10,200 horizontal grid cells and one vertical layer.

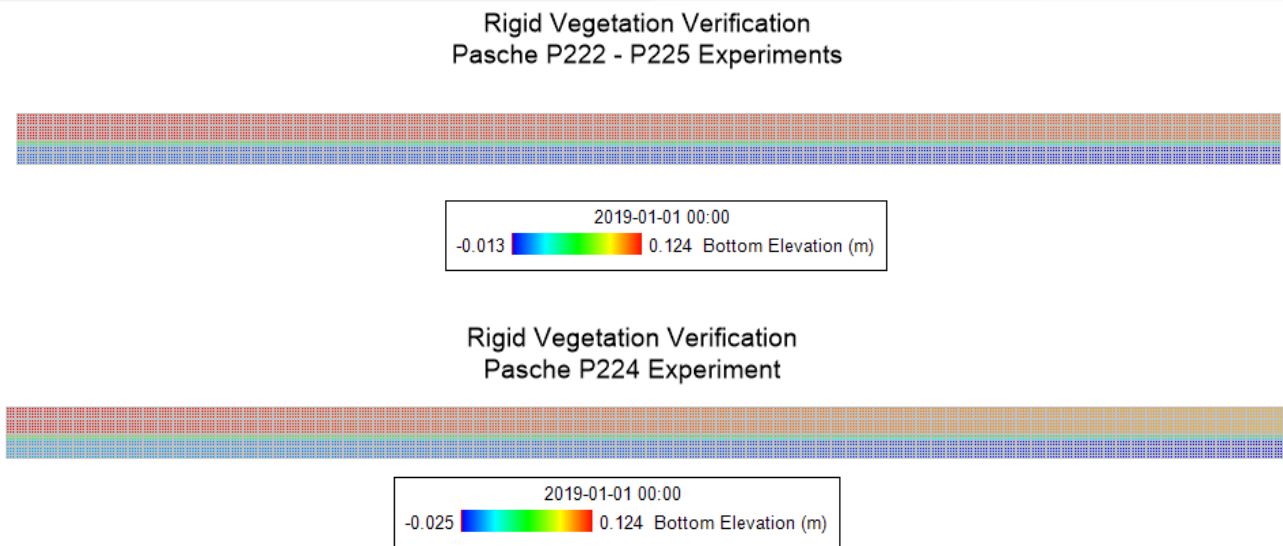


Figure 1. Model Domain of TC-11 Rigid Vegetation.

Folder structure:

Model: Three EFDC models corresponding to three experiments of Pasche and Rouvé.

Test_record file: This file is just a record file that informs which EFDC+ executable was used to run the model.

Modules Activated: Hydrodynamics

Description: The study undertaken Pasche and Rouvé (1985) looks at the interaction of submerged vegetation interaction with flow in a flume. The flume and vegetation configurations have been replicated in an EFDC+ model to validate and improve understanding of how EFDC+ handles submerged vegetation in open channels. Comparison of the measured velocity over the width of the channel with modeled velocity is shown in Figures 2 to 4.

Disclaimer: The model is provided to our users to demonstrate that EFDC_Explorer and EFDC+ can be used to better understand how to build this kind of model. The model is running as expected; however, shouldn't be considered final as the model can be modified / refined to obtain improved results.

Citation for the paper:

T. Fischer-Antze, T. Stoesser, P. Bates and N.R.B. Olsen (2000), "3D numerical modelling of open-channel flow with submerged vegetation", *Journal of Hydraulic Research*, Vol. 39, 2001, No. 3

Pasche, E. and Rouvé, G., 1985. Overbank flow with vegetatively roughened flood plains. *Journal of Hydraulic Engineering*, 111(9), pp.1262-1278.

Files in Data Folder:

- floodplain_Plg.p2d
- IC_WSEL_P222.xyz
- mainchannel_plg.p2d
- Measured data_Pasche P222.dat
- Measured data_Pasche P224.dat
- Measured data_Pasche P225.dat
- slope_plg.p2d

Data sources: The data provided in the "Data" folder are derived from the journal paper mentioned above.

Model results:

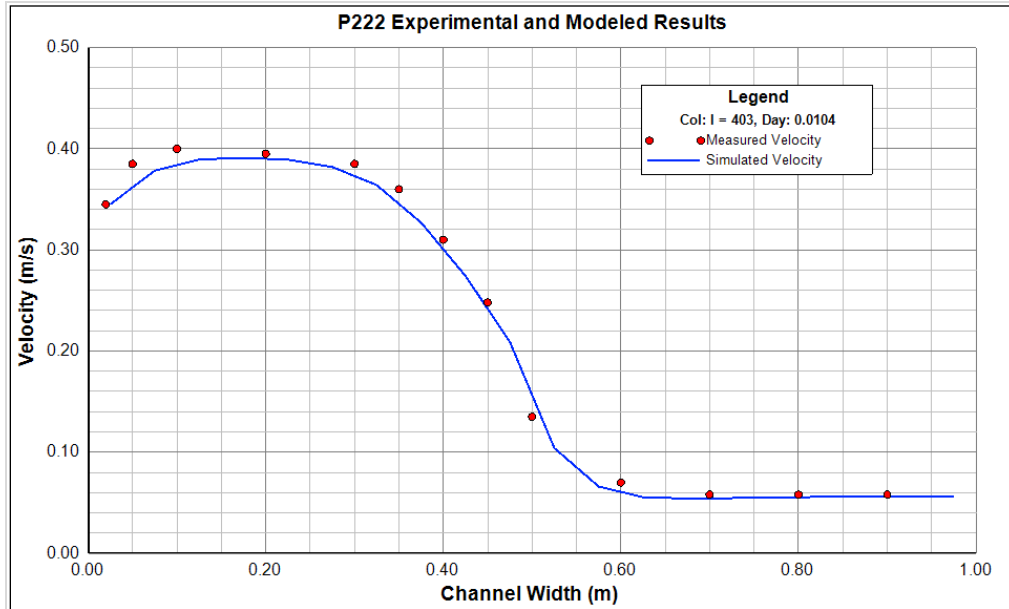


Figure 2. Modeled and P222 experimental velocity comparison.

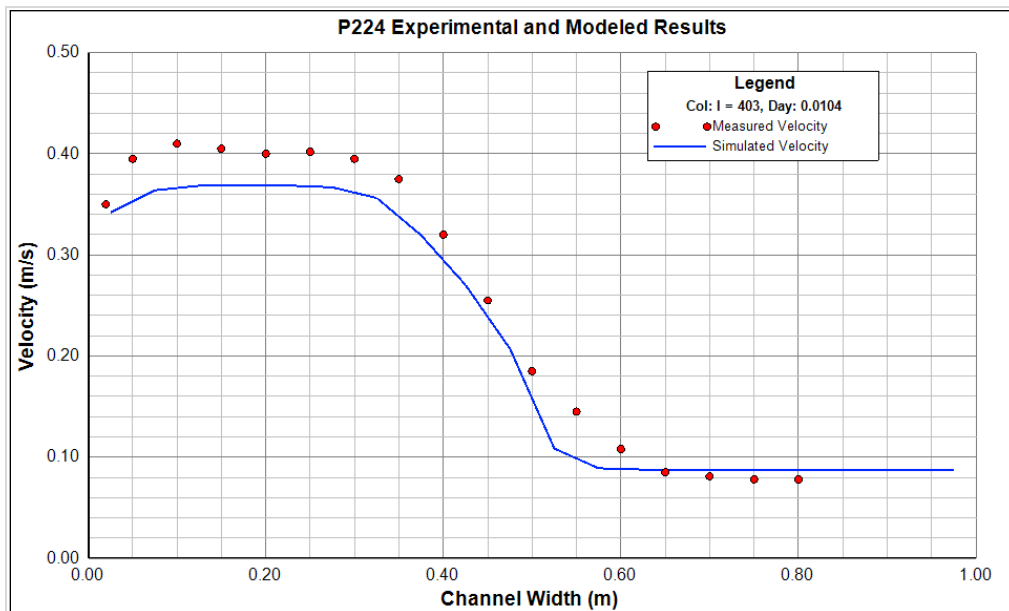


Figure 3. Modeled and P224 experimental velocity comparison.

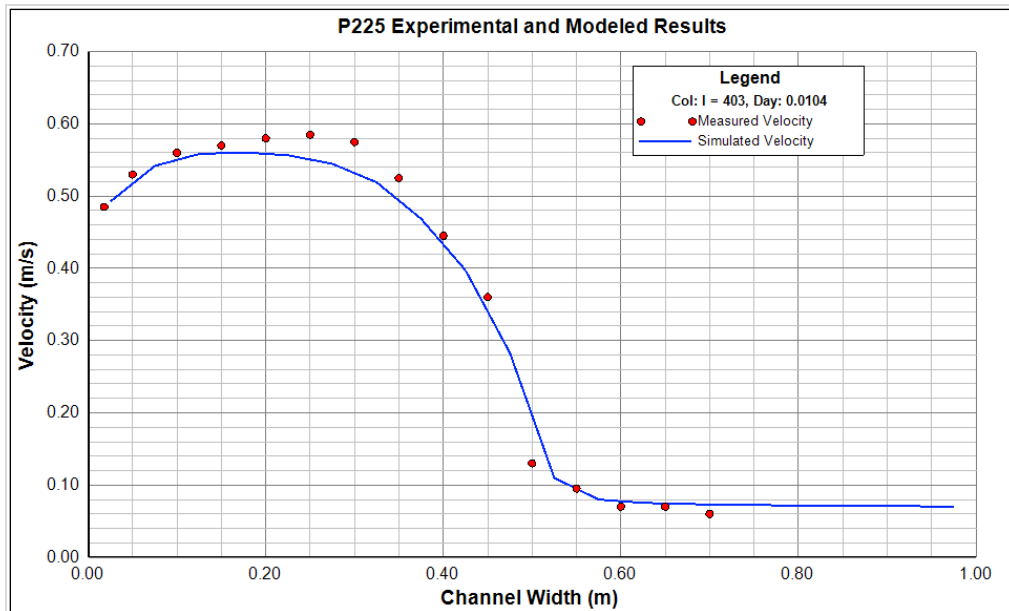


Figure 4. Modeled and P225 experimental velocity comparison.