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# Investigating the validity of Telemac2d-Sisyphe model for predicting bed evolution in meandering channels

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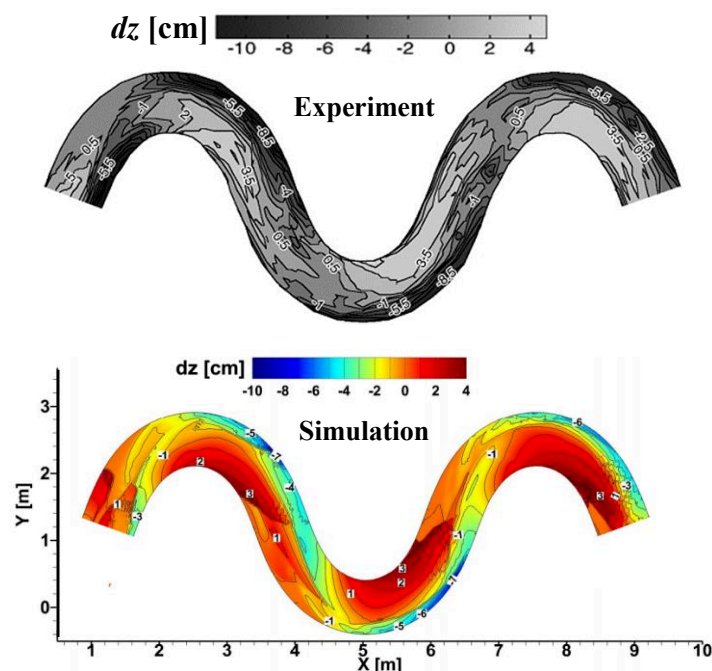
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Meandering channels are one of the most studied topics in fluvial geomorphology due to its unique morphodynamics. However, various channel processes governing meander planform are yet to be understood fully. It is therefore important to understand the channel morphological characteristics before planning any countermeasures. Numerical modeling are helpful to study the dynamic interaction of flow, bed and banks in meandering channels. Identifying the critical locations of channel erosion as well as the bed morphology through numerical simulation could be vital in the planning and implementation of bank protection structures. In this context, the current study aims to investigate the applicability of coupled telemac2d-sisyphe model in predicting the flow and morphological evolution of meandering channels.

We applied the model to an experimental data in sine-generated channels available from the literature. In telemac2d, k-e model was used for turbulence modeling while the effect of secondary flow was taken into account. For sisyphe model, non-uniform sediment transport with Meyer-Peter and Müller empirical formula of bed load transport was used for calculating the bed-load transport.

Figure below represent the bed topography changes at the end of the experiment and the simulation period of 170mn. Negative values represent erosion while the positive ones represent the deposition. As it can be seen, simulated results are in a close agreement with the observed ones in terms of the pattern of channel evolution. Simulation has quite well reproduced the various bed morphological features obtained in the experiments like deep scour along the outer banks as well as the point bar along the inner bank. The location and the extent of erosion and deposition is nearly the same in both the experiments and the simulation. It is concluded that telemac2d-sisyphe can reasonably replicate the meandering channel morphodynamics. The model can therefore be applied to study various scenarios in meandering channels.



**Key words:** meandering channel, bed evolution, secondary flow, telemac2d, sisyphe

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