6th Global Summit of GADRI Networking Institutes
Sediment Transport Modelling

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Background

Flood events are accompanied with the dislocation of material in general, such as debris and sediments. Scouring may lead to the collapse of buildings and destruction of infrastructure. At other places sedimentation, decreasing water depth, becomes a problem.
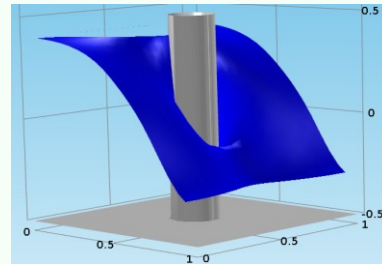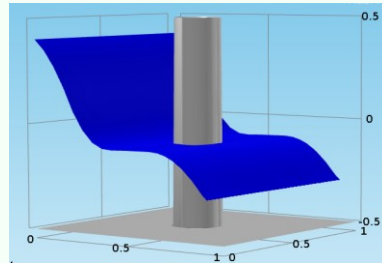
Objectives

An approach was developed to model scouring and sedimentation in shallow water that can be applied for identifying sediment transport problems due to flood events. The approach is not yet validated against real world situations.

Expectation from a future partner

We search suitable application cases to validate the model approach, developed at GUtech (see: Seeds !). That could be laboratory measure-ments or field observations.

Seeds and Needs

Seeds !

Figures 1

A finite element model was developed that simulates flow and transport in a river, channel or wadi during a flood event. In the model the shallow water equations are coupled with the transport of suspended load and bedload. From the latter changes of the water depth are computed.

Results from an example computation are shown in the subplots of Figure 2, showing water table and ground level.

Figures 2

Colorplots of water table and ground level (in grey). Sequence 1-2-3-4.

Holzbecher E. & Hadidi A., Sediment transport in shallow water, in: Sumi T., Kantoush S., Saber M. (eds), Wadi Flash Floods, Springer Nature, Singapore
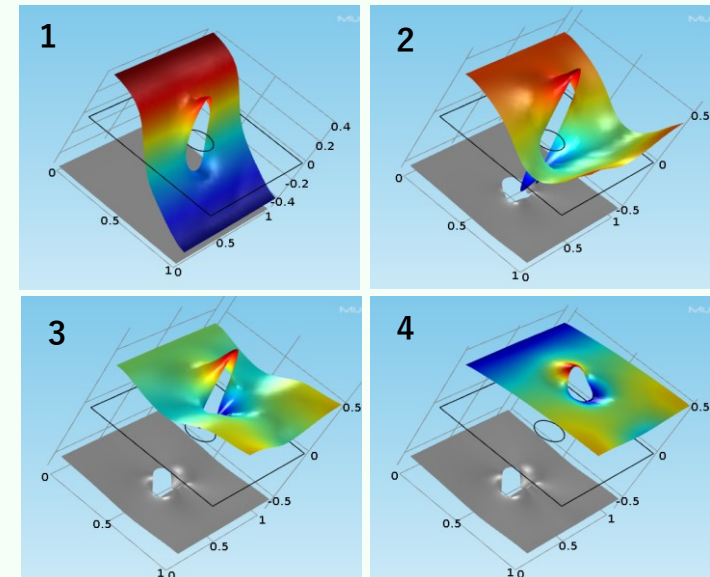
Needs !

Application cases wanted! Such as the one depicted in Figure 1, where a flood front passes a column of a bridge. We are looking for data for the examination and validation of the model to simulate real world phenomena.