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Simulation of sediment transportation on Natorsa Creek by RiverFlow2D and SRH-2D

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In recent years, two-dimensional sediment transportation on movable bed models have been widely used in hydraulic engineering. Because of different assumptions, each model has its own feasibility on specified issues and areas. The SRH-2D model is an implicit method of the finite-volume method without CFL stability conditions, and requires more calculations than the explicit one at each time step. On the other hand, RiverFlow2D is an explicit method of finite-volume method with CFL conditions and saves much more time. In order to compare the results from these two software, a case study of Natorsa Creek, Kaohsiung, Taiwan, is carried out on the sensitivity analysis and different structure setups associated with rainfall data, water level record and DTM. The principle results are as following: This study uses average absolute error (MAE) and mean square root error (RSML) to investigate the sensitivities of SRH-2D and RiverFlow2D models and finds out the operation time increased with shorter time interval. Although SRH-2D supports three formulas while RiverFlow2D supports ten, it takes more factors into account like secondary flow, sediment size distribution, and the bed armoring effect. The simulation of scour-and-fill condition by these two models has shown similar result. However, there still exists small discrepancy between software simulation and field investigation.