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The mechanism of gravel movements –an observation from flume experiments

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This study tries to find the mechanism and methods of gravel movements by using the flume at Freie Universitat Berlin. Flume and video recording are applied at different slopes and arrangement of gravel on flume. The diameter of gravels ranged between 3-8 cm.
Through repeated experiments, the movements of gravel at the slope between 2-7 degrees had different behaviors. The results show that:
1. The average of flow speed changed when the slope of channel change from 1.5 to 3 m/sec. The hydrologic power also changed. It is also found that the flow speed to remove the gravels is also changed when changing the degree of slope.
2. Through the video recording, the movements of gravels can be recorded every 1/30 seconds. The path of gravel and flow also can be traced. It is found that the gravels behave different according to the arrangement of gravel on flume beds.
3. The threshold value of flow speed to trigger the gravel ranging from 2 to 2.5 m/s. It is also found that the flow speed within the flume can be varied. However the triggering values of flow speed at different slope angles are also found in this study.
4. The flow paths are also interesting. The size and alignment of gravels also change the paths at different flow speed. The width of the flume can change the path of the flow easily. It is needed to prevent the influence of the edge.
This paper demonstrates above changes and behaviors.