



## **Dynamic transport of suspended sediment by solitary wave: Experimental study**

JaeNam cho (1), DongHyun Kim (1), KyuNam Hwang (2), and SeungOh Lee (1)

(1) HongIk University, Seoul, Republic Of Korea(changbo2001@gmail.com), (2) ChonBuk National University, Jeonbuk, Republic Of Korea(khwang@jbnu.ac.kr)

Solitary waves are able to transport a large amount of suspended sediment when approaching on the beach, which sometimes causes - serious beach erosion, especially in the east and south coastal lines in Korea. But it has rarely been known about the method how to evaluate or estimate the amount of beach erosion caused by solitary waves. Experimental assessment is necessary to comprehend the process of sediment transport on a slope. The prismatic rectangular channel is 12 m long, 0.8 m wide, and 0.75 m high. A sluice gate is applied at prismatic channel in order to produce the solitary waves. Upstream water depth is more than channel water depth and the sluice gate is suddenly opened to simulate conditions of solitary waves. A sand slope with a 1/6 and a sediment thickness is 0.03 m. The experimental sediments are used anthracite ( $d_{50}=1.547$  mm,  $C_u=1.38$ ) and Jumoonjin sand ( $d_{50}=0.627$  mm,  $C_u=1.68$ ). Specific laboratory equipment are designed to collect suspended sediment samples at the same time along the wave propagation at 5 points with evenly space. Each amount of sampling is approximately 25 ml and they are completely dried in oven over 24 hours according to the USGS (Guideline and standard techniques and method 3-C4). Two video cameras (Model No. : Sony, HDR-XR550) are mounted for capturing images at top and side-view when the processes of solitary wave and run up/down on slope. Also, this study are analyzed the correlation between Suspended sediment concentration and turbidity. Also, this study are analyzed the correlation between suspended sediment concentration and turbidity. Turbidity is used to verify suspended sediment concentration. Dimensionless analyses of experimental results carried out in this study. One dimensionless parameter is expressed with pressure of solitary wave on a slope to suspended sediment concentration, which is concerned about lifting force. The other is relate to drag force presenting with run up/down velocity on a slope and suspended sediment concentration. The results from this study would provide fundamental relation between solitary wave and suspended sediment concentration based on relatively quantitative laboratory experiments.