

Abstract

The impact of a dam-break wave on an erodible embankment with a steep slope has been studied recently using both experimental and numerical approaches. In this paper, the semi-implicit staggered scheme for approximating the Shallow Water Equation - Exner model will be elaborated to describe the erodible embankment (in the form of sediment) on a steep slope. This scheme is known as a robust scheme to approximate shallow water-Exner model. The results are shown in a good agreement with the experimental data. The comparisons of numerical results with data experiment using slopes $\Phi = 59.04^\circ$ and $\Phi = 41.42^\circ$ by coefficient of Grass formula $A_g = 2 \times 10^{-5}$ and $A_g = 10^{-5}$ respectively are found the closest results to the experiment. This paper can be seen as the additional validation of semi-implicit staggered scheme in the paper of Gunawan, et al (2015).

Keywords: SWE-Exner, Staggered Scheme, Dam-break, Slope.