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The Compare Derived Flood from Laplace Transform and H2U-Nash Instantaneous Unit hydrograph Models (Case Study: Jooneghan Catchment)

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Abstract

Achievement to sustainable development is dependent upon integrated watershed management. In other hand without detailed analysis of the rainfall - runoff observations, high risk of flood predictions will be translated into flood-induced capital losses. Considering the fact that not always hydrometric data are available, using synthetic unit hydrograph is one of the most popular methods of flood simulations for ungauged watersheds. This method has operational limitation for duration of runoff but in Instantaneous Unit Hydrograph (IUH) assumed to all take place at a discrete point in time therefore can be converted into and desired durations.According to literature few studies have been focused on Laplace transforms, H2U-Nash Unit Hydrograph in Iran, this work is an attempt to investigate model performance in Jooneghan catchment, located in northern part of Karoon great basin.Laplace synthetic hydrograph was derived base on effective rainfall while H2U-Nash model was simulated using moments technique and lag time.The mean absolute relative error of Laplace transforms, H2U-Nash was 0.42 and 0.25 respectively. Visual interpretation and statistical comparison of Nash-Sutcliffe efficiency coefficient of the models confirms that H2U-Nash model performs better than Laplace transforms model.

Key words: Instantaneous unit hydrograph, Laplace transform, H2U-Nash, Jooneghan.

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