

Regionalization of IDF Curves with L-Moments for Storm Events

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Abstract : The construction of Intensity-Duration-Frequency (IDF) curves is one of the most common and useful tools in order to design hydraulic structures and to provide a mathematical relationship between rainfall characteristics. IDF curves, especially those in Peninsular Malaysia, are often built using moving windows of rainfalls. However, these windows do not represent the actual rainfall events since the duration of rainfalls is usually prefixed. Hence, instead of using moving windows, this study aims to find regionalized distributions for IDF curves of extreme rainfalls based on storm events. Homogeneity test is performed on annual maximum of storm intensities to identify homogeneous regions of storms in Peninsular Malaysia. The L-moment method is then used to regionalized Generalized Extreme Value (GEV) distribution of these annual maximums and subsequently. IDF curves are constructed using the regional distributions. The differences between the IDF curves obtained and IDF curves found using at-site GEV distributions are observed through the computation of the coefficient of variation of root mean square error, mean percentage difference and the coefficient of determination. The small differences implied that the construction of IDF curves could be simplified by finding a general probability distribution of each region. This will also help in constructing IDF curves for sites with no rainfall station.

Keywords : IDF curves, L-moments, regionalization, storm events

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