A 60-Minute Design Rainstorm for the Urban Area of Yangpu District, Shanghai, China

Yuanfang Chen and the Anqi Wang et al

Hohai University, College of Hydrology and Water Resources and, Nanjing, China (19870056@hhu.edu.cn)

Abstract: Rainfall with varied temporal distribution is an essential input to urban flood models.In this study, a 60-min design rainstorm with different return periods for the urban area of Yangpu District, Shanghai, China was derived. The design of areal rainfall amounts with given return periods was calculated through frequency analysis. The temporal distribution of the hyetograph was derived using the Pilgrim and Cordery method, combined with the fuzzy identification of seven mode hyetographs for single-peak and double-peak rainstorms separately. The derived hyetographs using the Pilgrim and Cordery method were compared with the classic Chicago rainstorm method. The results indicated that: (1) separating single-peak and double-peak rainstorms to derive respective hyetographs is more practical and rational; (2) a design rainstorm using the proposed methodology is superior to the Chicago rainstorm method.
Keywords: design rainstorm; design hyetograph; mode hyetographs; fuzzy identification method; Pilgrim and Cordery method