

Impacts of temporal dependent errors in radar rainfall estimate for rainfall-runoff simulation

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Abstract

Weather radar has been widely used in measuring precipitation and discharge and predicting flood risks. The radar rainfall estimate has one of the essential problems in terms of uncertainty and accuracy. Previous study analyzed radar errors to reduce its uncertainty or to improve its accuracy. Furthermore, a recent analyzed the effect of radar error on rainfall-runoff using spatial error model (SEM). SEM appropriately reproduced radar error including spatial correlation. Since the SEM does not take the time dependence into account, its time variability was not properly investigated. Therefore, in the current study, we extend the SEM including time dependence as well as spatial dependence, named after Spatial-Temporal Error Model (STEM). Radar rainfall events generated with STEM were tested so that the peak runoff from the response of a basin could be investigated according to dependent error. The Nam River basin, South Korea, was employed to illustrate the effects of STEM on runoff peak flow.

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Key words : Errors; Rainfall-Runoff simulation; Radar Rainfall Estimate; Spatial dependent; Time dependent;

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