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Simulation of Optimal Runoff Hydrograph Using Ensemble of Radar Rainfall and Blending of Runoffs Model

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Abstract : Recently, the localized heavy rainfall and typhoons are frequently occurred due to the climate change and the damage is becoming bigger. Therefore, we may need a more accurate prediction of the rainfall and runoff. However, the gauge rainfall has the limited accuracy in space. Radar rainfall is better than gauge rainfall for the explanation of the spatial variability of rainfall but it is mostly underestimated with the uncertainty involved. Therefore, the ensemble of radar rainfall was simulated using error structure to overcome the uncertainty and gauge rainfall. The simulated ensemble was used as the input data of the rainfall-runoff models for obtaining the ensemble of runoff hydrographs. The previous studies discussed about the accuracy of the rainfall-runoff model. Even if the same input data such as rainfall is used for the runoff analysis using the models in the same basin, the models can have different results because of the uncertainty involved in the models. Therefore, we used two models of the SSARR model which is the lumped model, and the Vflo model which is a distributed model and tried to simulate the optimum runoff considering the uncertainty of each rainfall-runoff model. The study basin is located in Han river basin and we obtained one integrated runoff hydrograph which is an optimum runoff hydrograph using the blending methods such as Multi-Model Super Ensemble (MMSE), Simple Model Average (SMA), Mean Square Error (MSE). From this study, we could confirm the accuracy of rainfall and rainfall-runoff model using ensemble scenario and various rainfall-runoff model and we can use this result to study flood control measure due to climate change. Acknowledgements: This work is supported by the Korea Agency for Infrastructure Technology Advancement(KAIA) grant funded by the Ministry of Land, Infrastructure and Transport (Grant 18AWMP-B083066-05).

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