

## An Ensemble Nowcasting of Rainfall over the Kanto Region, Japan

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Every year weather-related disasters: extreme rainfall, landslides and flooding destroy livelihoods and damage economics somewhere on the planet. Recently, number of flash flooding is believed to be increasing specially in urban areas. It has being a great challenge to forecast flood warning and urban drainage management. Nowcasting of rainfall (very short-range forecasting) is an important tool to minimize or manage all these weather-related disasters since precipitation is the main input. Common practice to forecast heavy precipitation for hydrological application varies from 0-6 hr and there are different kinds of nowcasting based on different method.

Nowcasting of rainfall comprises the detailed description of the current weather along with forecasts obtained by extrapolation for a different time period ahead. In this study, we focus on ensemble nowcasting of rainfall. It refers to the fact that many forecasts are produced, with the rainfall areas moving at slightly different speeds, and with the small rainfall features represented by slightly different random statistics. By comparing these different nowcasting of rainfall, the forecaster can decide how likely a particular weather event will be. It gives a much better idea of what weather events may occur at a particular time. Short Term Ensemble Prediction System (STEPS), one of the most advanced Quantitative Precipitation Forecast (QPF) systems currently available is considered for nowcasting of rainfall. Japan Meteorological Agency (JMA) and X-band multi-parameter (MP) radar data were considered to produce an ensemble nowcasting of rainfall. First, JMA radar rainfall data of Kanto region was fixed to check the performance of STEPS. Skill scores showed that STEPS can give a good forecast for less than one hour. However, more uncertainties can be seen during the starting and ending of rain event. High resolution of data (MP data) also used in the STEPS under the default condition. Overall, an ensemble nowcasting of rainfall seems close with real time data, which could be interesting to use them in hydrological model.

Keywords: nowcasting, ensemble, weather radar, extreme rainfall, STEPS, hydrological model