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## Deep learning model for heavy rainfall nowcasting in South Korea

#### Abstract

Accurate nowcasting is critical for preemptive action in response to heavy rainfall events (HREs). However, operational numerical weather prediction models have difficulty predicting HREs in the short term, especially for rapidly and sporadically developing cases. Here, we present multi-year evaluation statistics showing that deeplearning-based HRE nowcasting, trained with radar images and ground measurements, outperforms short-term numerical weather prediction at lead times of up to 6 h. The deep learning nowcasting shows an improved accuracy of 162%–31% over numerical prediction, at the 1-h to 6-h lead times, for predicting HREs in South Korea during the Asian summer monsoon. The spatial distribution and diurnal cycle of HREs are also well predicted. Isolated HRE predictions in the late afternoon to early evening which mostly result from convective processes associated with surface heating are particularly useful. This result suggests that the deep learning algorithm may be available for HRE nowcasting, potentially serving as an alternative to the operational numerical weather prediction model.

### Keyword

Deep-Learning

#### Reference

Oh, S.-G., S.-W. Son, Y.-H. Kim, C. Park, J. Ko, K. Shin, J.-H. Ha, and H. Lee, 2024: Deep learning model for heavy rainfall nowcasting in South Korea. *Weather and Climate Extremes*, **44**, 100652, <u>https://doi.org/10.1016/j.wace.2024.100652</u>.