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Improving sub-seasonal forecasting of East Asian monsoon precipitation with deep learning

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Accurate subseasonal forecast of East Asian summer monsoon precipitation (EASM) is pivotal, impacting the livelihoods of billions. However, the proficiency of state-of-the-art subseasonal-to-seasonal (S2S) models in forecasting precipitation remains constrained. We developed a convolutional neural network regression model, harnessing the more reliably predicted atmospheric variables from dynamic models to enhance their forecast skills for precipitation. The outcomes of the CNN model are promising: a 12% increase in accuracy and a 10% reduction in RMSE for precipitation forecast at the lead time of one week. The predictive skill of dynamic models for atmospheric variables shows a significant correlation with the performance of the CNN model. Ablation experiments on various predictors reveal that xx is the most influential factor affecting the CNN model's performance.