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On the Dynamical Downscaling of Multi-model Ensemble Forecasts for Sub-seasonal Predictions of Extreme Weather Events

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Abstract:

The massive social-economic impacts of heavy precipitation events demand reliable prediction at requisite response-time window. The extreme rainfall events are associated with different weather systems which originate from air-sea interactions, further modified by orography or other regional characteristics. Keeping aforementioned aspects in view, a forecast strategy based on dynamical downscaling of coarse resolution global forecasts is considered to improve the predictions of high impact precipitation events. Hypothesizing on the fact that weather systems producing torrential rains are nested within large-scale systems, predictions from low resolution global models proficient in simulating large-scale systems can be more advantageous with downscaling. An attempt has been made to downscale set of forecast ensembles from global coupled model CFS (climate forecast system) and its atmospheric component, both at higher(T382) and lower resolution(T126). WRF (Weather Research and Forecasting) at 9km is used in this study. Initial results reveal that high resolution downscaled forecasts at sub-seasonal scale has shown improvements compared to coarse resolution raw forecasts without downscaling.

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