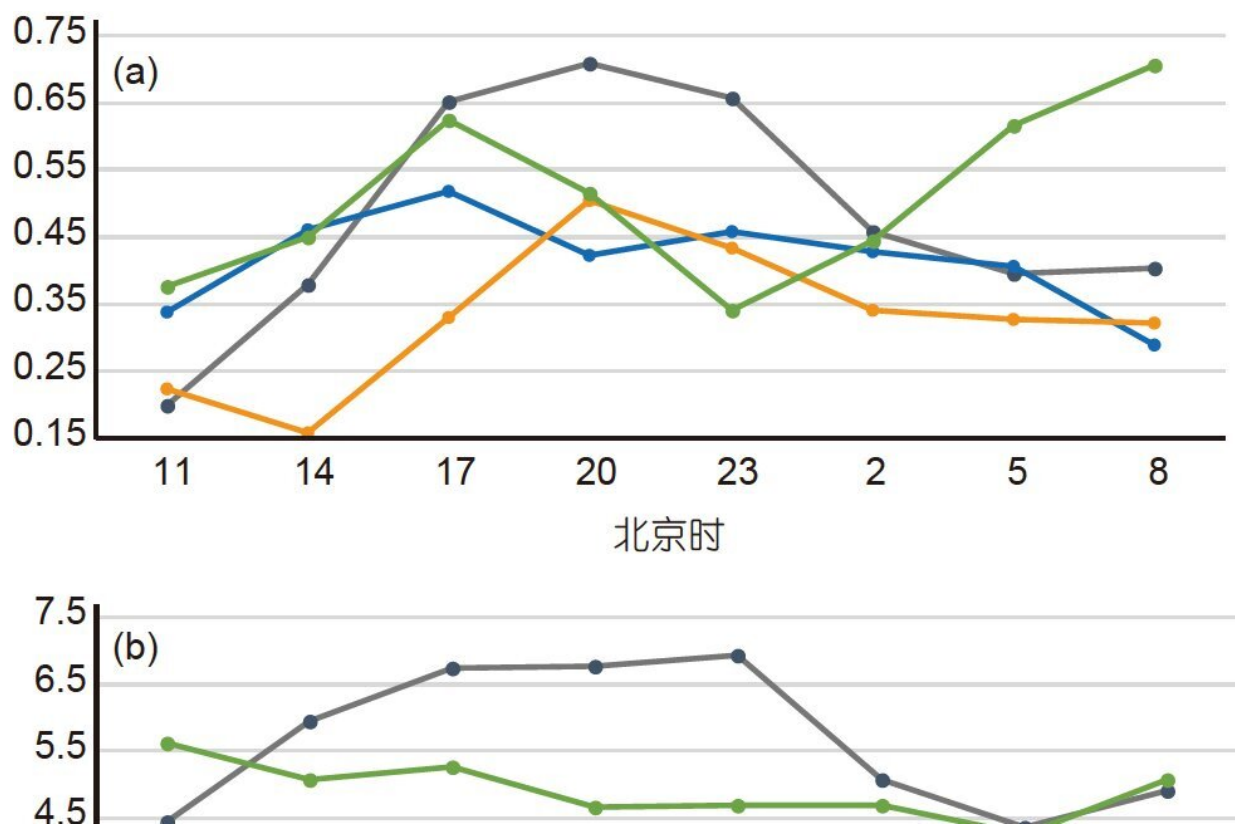


Multi-model forecast biases of the diurnal variations of intense rainfall in the Beijing-Tianjin-Hebei region

August 30 2022



(a) mean precipitation, (b) mean precipitation intensity, and (c) mean precipitation frequency. Credit: Science China Press

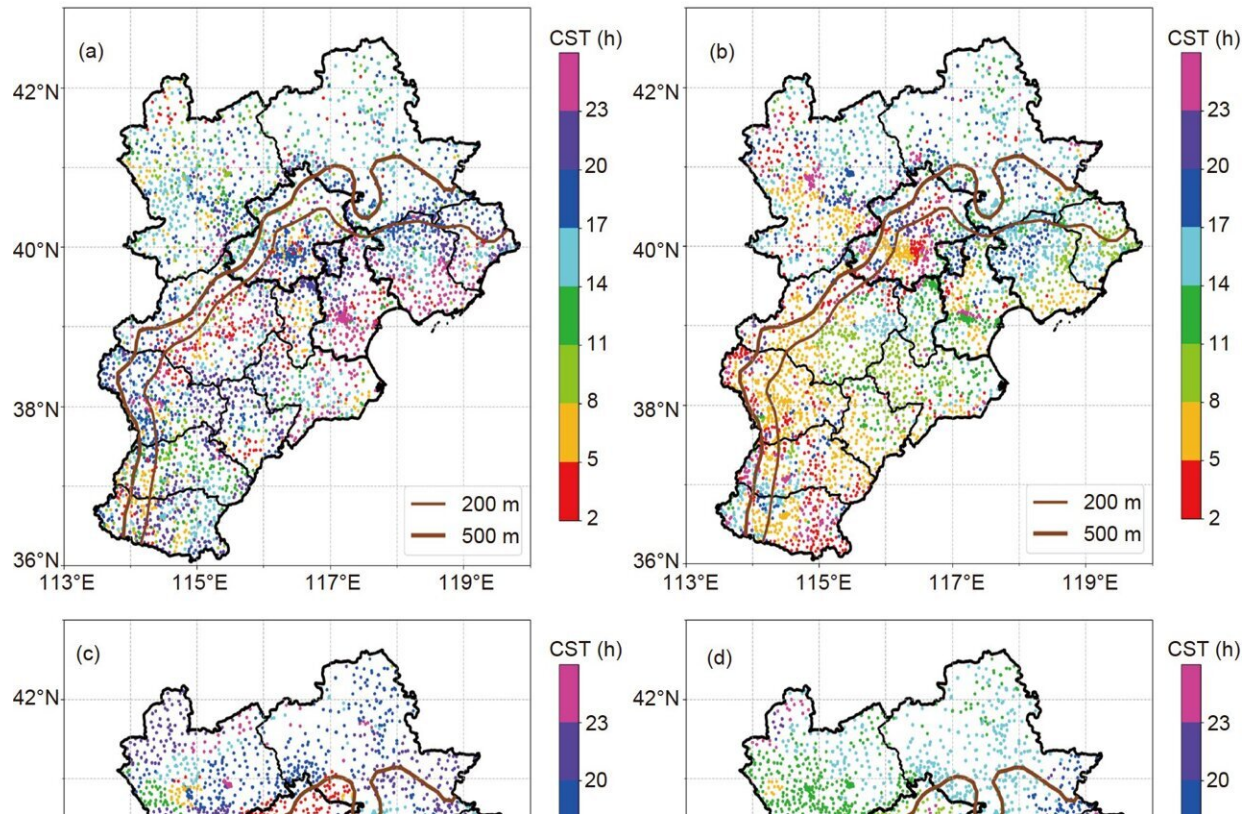
In a study led by Prof. Qi Zhong (China Meteorological Administration

Training Center), Dr. Haoming Chen (Chinese Academy of Meteorological Sciences), and Meteorologist Zhuo Sun, Jiangbo Li, Lili Shen of Hebei Meteorological Observatory, intense rainfall events in the Beijing-Tianjin-Hebei region (BTHR) were categorized into two types: those mainly due to strong synoptic forcings (SSF) and those with weak synoptic forcings (WSF).

The common biases showed that the numerical forecasts tend to overestimate the frequency of intense rainfall events but underestimate the rainfall intensity. Of these, the overestimation of precipitation frequency mainly appeared in the [mountainous areas](#) in the afternoon.

Although the high-resolution mesoscale models showed a notable improvement in forecasting the afternoon intense rainfall compared with global models, they all have an obvious [bias](#) in forecasting the nighttime [rainfall](#). For the WSF type, both the global model and mesoscale model have a low forecast skill, with large biases in the sub-daily propagation feature. The possible causes are related to a poor performance of the model in reproducing the local thermodynamic circulations and the dynamical processes in the planetary boundary layer.

The research was published in *Science China Earth Sciences*.



(a) is observation, (b) is the GRAPSE3km forecast, (c) is the SMS-WARMS forecast, and (d) is the ECMWF_HR forecast. Credit: Science China Press

More information: Qi Zhong et al, Multi model forecast biases of the diurnal variations of intense rainfall in the Beijing-Tianjin-Hebei region, *Science China Earth Sciences* (2022). [DOI: 10.1007/s11430-021-9905-4](https://doi.org/10.1007/s11430-021-9905-4)

Provided by Science China Press

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