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The role of El Niño in the extreme Mei-yu rainfall in 2020

Abstract

This article aims to investigate the extreme Mei-yu event in 2020, which result in the devastating floods in the middle and lower Yangtze River valley (YRV). Usually the heavy Mei-yu occurred in the decaying phase of extremely strong El Niño events. However, the unusually heavy Mei-yu and flood in 2020 were preceded only by a weak El Niño in the central equatorial Pacific, and thus caught many forecasters by surprise. So the article was tried to find the cause of this peculiarity through data analysis and a set of model experiments.

The results indicate that the positive Indian Ocean basin mode (IOBM) and the sudden decay of the CP El Niño in mid-2020 significantly contributed to ascending anomaly over the Maritime Continent, which enhanced the subtropical high over the South China Sea and the convergence over the YRV. It is the zonal temperature gradient across the tropical Indo-Pacific Ocean before and during the Mei-yu season, rather than the magnitude of the preceding El Niño or Indian Ocean warming, that determines the strength and duration of the Mei-yu. The results highlight the combined effects of the weak CP El Niño and positive IOBM on extreme Mei-yu event.

Keywords

Central Pacific El Niño

Indian Ocean basin mode (IOBM)

Reference

Chu, Q., Lian, T., Chen, D., Wang, X., Feng, J., Feng, G., Qu, S., & Zhang, Z. (2022).

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