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Extratropical Factors Affecting the summer precipitation variability over the Yangtze River Basin in China

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As the most important river in China, the Yangtze River is subject to flooding in summer. Substantial effort has been devoted to understand the physical causes of the floods, and a well-known fact is the seesaw relationship in precipitation between the tropical Western North Pacific and the Yangtze River Basin in the subtropics. In order to better understand the precipitation variability in the Yangtze River Basin, in this study we investigated the physical factors besides the precipitation variability in the tropical Western North Pacific. We removed the tropical-related component from the precipitation variability in the Yangtze River Basin through a linear regression, and focused on the residual component in order to highlight the physical factors besides the tropical precipitation variability. The results indicate that the northerly anomaly in the lower troposphere north to the Yangtze River Basin and the equatorward shift of the East Asian jet in the upper troposphere are favorable for heavier rainfall in the Yangtze River Basin. Moreover, the effect of the wave train along the Asian jet has been found to show an interdecadal change: the wave train significantly affects the precipitation variability in the Yangtze River Basin from 1958 to 1978, but this effect becomes much weaker from 1979 to 2013.