



Relationship between Summer Rainfalls over North China and India and Its Genetic Analysis

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Based on the Reanalysis data and the observational data, the relationship between the summer rainfalls over North China and India were analyzed. With the ensemble empirical mode decomposition (EEMD) method, the two rainfall time series were decomposed into different time scales. For the formation of the positive correlation between them on the interannual scale, this study analyzed the favorable and unfavorable circulation patterns. The results showed that the relatively good correlation between the two rainfall time series was primarily contributed by the interannual scale component with 2–3 years, on which the correlation coefficient was 0.34, exceeding 99% confidence level. On the interannual scale, anomalous Indian summer monsoon (ISM) rainfall could induce the circum-global teleconnection (CGT) pattern in the middle and upper troposphere, which would act as a bridge to make the anomalous circulations over the Iranian Plateau and the region around Bohai Sea (cyclonic or anti-cyclonic anomaly circulation) to vary in phase, thus causing the summer rainfall anomalies over North China. However, such a relationship does not always hold. The CGT is sometimes absent when the anomalous circulation over the Iranian Plateau associated with the ISM rainfall mainly is situated in the westward position. In this situation, even if there is a significant anomalous ISM rainfall, the summer rainfall over North China is likely to be influenced by the East Asia-Pacific (or West Pacific) teleconnection pattern and thus is out of phase with the ISM rainfall anomaly. These results would be helpful to deepen our understanding of the relationship between the summer rainfalls in North China and India, thus providing some clues for the prediction of North China summer rainfall.