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Zonal Seesaw-like Distribution of Spring Precipitation over South China and Characteristics of Atmospheric Circulation in the Anomalous Climate Years

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The spring (March to May) precipitation of 18 stations over South China during the period of 1951∼2007 are analyzed by using the method of EOF analysis. The results show that the spatial distribution of spring precipitation over South China shows 4 main patterns that are the consistency of the whole region, anti-phase between east and west, anti-phase between north and south, anti-phase between northeast and southwest etc. The second eigenvector of the spring rainfall in South China mainly reflects the zonal distribution of non-uniform, so the spring rainfall pattern in South China are divided into the type of west flood and east drought, east flood and west drought. The characteristic of its associated atmospheric circulation background in the zonal distribution of spring precipitation anomalies years are analyzed by using NCEP reanalysis data, and the results show that, in the west flood and east drought years, an positive anomaly center of sea level pressure field and height field at 850 hPa is located in the northwest of South China, which is beneficial to the cold air down south. A negative anomalous sea level pressure and height at 850 hPa appear in the south of this positive center, and there presents a positive anomalous sea level pressure and height at 850 hPa in the east of South China and its eastern sea area. An southeast wind anomaly occurs in the west of South China, while there is an anomalous northeast wind in the east of South China. The wind field and water vapour transport field present abnormal convergence in the west of South China, but in the east of South China they perform an abnormal divergence, causing more precipitation in the west of South China but less precipitation in the east of South China. In the meantime, vorticity field at 850 hPa, divergence field at 200 hPa, vertical velocity field at 850 hPa and temperature field at 1000 hPa all show the circulation situation that is favorable for increase of precipitation in the west of South China and decrease of precipitation in the east of South China. In the west drought and east flood years, the situation is basically the opposite.

Key words: spring precipitation over South China, drought and flood, temporal and spatial distribution, zonal seesaw-like distribution, circulation anomalies