



Analysis on Precipitation Distribution Pattern and its Background Circulation during Extratropical Transition of Tropical Cyclone Usagi

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Using the data of NCEP reanalysis data, rainfall data from TRMM (Tropical Rainfall Measuring Mission) and RSMC Best-track database, the precipitation distribution characteristics during extratropical transition (ET) of tropical cyclone (TC) Usagi was analyzed. Furthermore, the effect of the intensity variation of subtropical high and westerly trough on precipitation distribution was studied by numerical sensitivity experiments. The results show that during the second landing, The TC transformed from a tropical cyclone to an extratropical cyclone very quickly, and the precipitation asymmetry occurred before the thermal asymmetry. During the ET process, the circulation pattern in the Asian region was changed from zonal to meridional, and this trend was continuously strengthened. The trough-ridge upstream to the TC centre is obvious, leading cold air to spread southward. Large-scale strong cold air and weak warm air was confronted each other. As a result, the cold front precipitation was formed and concentrated on the left side of the TC track. The southwest section of the rain belt is stable stratiform cloud precipitation, while the northeast section is intense convective precipitation. The numerical experiments showed that the subtropical high affected a little on the track and precipitation asymmetry of the TC, whereas the strengthened trough northwest to the TC was beneficial to the concentration of strong precipitation to the left side of movement track. (This research was supported by the National Natural Science Foundation of China under Grant Nos. 41375049, 40905021 and 41275099)

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