Study on the severe weather caused by mesoscale convective system on the Meiyu front in northwestern Taiwan

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Along the coast of northwestern Taiwan, when the Meiyu front passed, there were occasional rapids caused by the terrain, and after convergence with the prevailing wind field, it caused severe precipitation. In 1987, some studies conducted by Taiwan mesoscale experiment (TAMEX) found that low-level jet (about 1 km high) under certain conditions, known as barrier jet, strongly affected the heavy rainfall in northern Taiwan. On the morning of June 2, according to the results of the study in the meiyu frontal contact north Taiwan, in just 12 hours later to Keelung and north coast down to the super heavy rain of reason, may be related to frontal subject in northern Taiwan snowy mountains, the enhancement of barrier jets occurring near the surface height is related to the increase in barrier jets during the movement of the frontal body, which leads to cyclonic circulation around the jet zone, accompanied by the instability of temperature gradients and the enhancement of positive vortex anomalies, which indicates the cause of the strong water in this case. Based on the observation data and model simulation results, this study analyzed the main causes and physical mechanisms of the severe precipitation in northwest Taiwan, and then speculated on the dynamic and thermodynamic processes of such weather phenomena over time.

Keywords: Meiyu front, Severe precipitation, Low-level jet, Barrier jet

