The Origins of the Mei-yu/Baiu Frontal Cyclones.

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This study shows the origins of the Mei-yu/Baiu frontal cyclones that induce rainfall events over Japan. A field experiment during the 1999 Mei-yu/Baiu season: X–BAIU–99 was conducted over southern Kyushu island and the eastern part of the East China Sea, and several rainfall events were observed. Two rainfall events during the X–BAIU–99 were focused in this study. A rainfall event on 27 June was induced by two significant rainbands accompanied by a meso-α-scale cyclone (its wave length was about 500km). Another rainfall event on 29 June was induced by a cold frontal rainband accompanied by a synoptic-scale cyclone (its wave length was about 2000km). These two Mei-yu/Baiu frontal cyclones were traced by using data from regional spectral model. The meso-α-scale cyclone was originated in the northeastern lee side of the Wuyi Mountains near Shanghai. The synoptic-scale cyclone was originated in the Yungui Highland, and moved along 30°N passing through Wuhan, Shanghai and the East China Sea. For investigating activity of the Mei-yu/Baiu frontal clouds near 30°N, TBB field averaged for the 9 days from 21 June to 30 June in 1999. The 9 days include the days of the meso-α-scale and synoptic-scale cyclones, and is a period that the Mei-yu/Baiu front was staying near 30 °N. A cloud band associated with the Mei-yu/Baiu front had three significant peaks of low TBB over China continent. The three peaks of low TBB were located at the Yungui Highland, the Liang-hu plain, and the Poyang-hu plain. These results from the present study show that it is very important to conduct observational experiments for the Mei-yu/Baiu frontal mesoscale phenomena in areas near 30°N over China continent (e.g., Wuhan and Shanghai).

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