

Distribution of Seasonal Rainfall in the East Asian Monsoon Region

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Summary

This study deals with the climatological aspect of seasonal rainfall distributions in the eastern Asian monsoon region, including China, Korea and Japan. Previously, rainfall patterns of these three countries have been investigated separately, and little attention has been paid to their linkage of seasonal rainfall patterns among these countries. This paper has contributed to the interlinkage of various subregions. Three datasets are used. One consists of several hundred gauges from China and South Korea. The second is based on the Climate Prediction Center (CPC) Merged Analysis of Precipitation (CMAP). The two sources of precipitation information are found to correspond well. The third dataset is the NCEP/NCAR reanalysis 850-hPa winds.

The CMAP precipitation shows that the seasonal transition over eastern Asia from the boreal winter to the boreal summer monsoon component abruptly occurs in mid May. From late March to early May, the spring rainy season usually appears over south China and the East China Sea, while it is not so remarkable in Japan. The summer monsoon rainy season over eastern Asia begins commonly from mid-May to late-May in longitudes of eastern China, the Korean Peninsula, and Japan. A strong quasi-20-day subseasonal oscillation in the precipitation appears dominantly in this rainy season. The ending date of summer monsoon rainy season in eastern China and Japan occurs in late July while the ending date in the Korean Peninsula finds in early

August. The autumn rainy season in the Korean Peninsula has a major range from mid August to mid September. In south China, the autumn rainy season is prevailing from late August to mid October but a short autumn rainy season from late August to early September is noted in the lower part of the Yangtze River. In Japan, the autumn rainy season is relatively longer from mid September to late October.

The rainfall subseasonal oscillation in Korea, eastern China and Japan are explained by and comparable to the 850-hPa circulation. The strong westerly frontal zone can be in charge of the location of the *Meiyu*, the *Changma*, and the *Baiu* in eastern Asia. A reason that the seasonal sea surface temperature change in the northwestern Pacific plays a critical role in the northward advance of the onset of the summer monsoon rainfall over eastern Asia is also discussed.