

Interannual Variability of the Baiu Front in May

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The Baiu front (BF) is a subsystem of the Asian summer monsoon bringing the rainy season in the East Asia–western North Pacific sector in June and July, which is usually formed in May. This work examines the interannual variability of the BF in May, diagnosing the global objective reanalysis data for the period of 1979-2015 (37 years).

In May, the two regions with relatively large precipitation expanding in southeastern China and to the southeast of Japan are connected by the activation of rainfall between them and form a large-scale zonal front, i.e., the BF. The activation is induced by the temperature advection in the middle troposphere from the south. Thus, the interannual variability of BF in May is caused by the timing and the strength of this temperature advection from the south. The anomalous cyclonic circulation appearing in the region of 5° - 35°N, 100° - 140°E controls the timing and the strength. This work further found that this anomalous cyclonic circulation was remotely forced as the Rossby type response of the intraseasonal oscillation (ISO) propagating on the equator from the Indian Ocean to the Pacific. Thus, the anomalous features of ISO near 130°E on the equator modulate the interannual variability of BF in May. The eastward propagation of ISO from the Indian Ocean to the Pacific on the equator implies that there exists predictability for the activity of BF in May.

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