

The Influence of the Intra-seasonal Oscillation from Tropic and Mid-high Latitudes on the Advance of East Asian Summer Monsoon

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Using the European Centre for Medium-Range Weather Forecasts (ECMWF) reanalysis daily data ERA40 and the daily rainfall data from 740 stations in China from 1958 to 2001, we analyze the influence of the climatological Intra-seasonal oscillation (CISO) on the advance of East Asian summer monsoon (EASM) average for 1958-2001. We find out that the onset and advance of EASM are mainly affected by low-frequency cyclones (or anti cyclones) belt from low latitudes, Pacific-North American (PNA) and the Europe-Asia(EUA) low-frequency teleconnection wave-train of the 30-60-day intra-oscillation. EUA and PNA low-frequency wave-train make the trough and ridge over mid-high latitudes and the Western Pacific Subtropical steady and strengthen. East Asian (EA) low-frequency teleconnection wave-train is the link between the intra-oscillations from low latitudes and mid-high latitudes, which affect the activity of EASM. The phase lock of 30-60-day and 10-25-day intra-oscillations is one of the important reasons that cause the jump of EASM. EUA teleconnection wave-train is favourable to the form and development of blocking highs, causing the cold air transport southward continually. The interaction between the cold air and the wet-warm monsoon stream coming from low latitudes make EASM move northward by the nonuniform speed, causing the seasonal variety of the summer rainfall in the east China add a fast process of the nonlinear intra-seasonal variability, and the space-time location of the precipitation is not well balanced, the heavy storm occur frequently in some region while other region have the continual drought.

Keywords: EASM Advance CISO the low-frequency teleconnection wave-train