

Interannual variability of rainy seasons onset over the eastern Indochina Peninsula

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The onset dates of rainy seasons over eastern Indochina Peninsula (8.5o-23.5oN, 100o-110oE) for individual years from 1958 to 2007 were objectively determined by the principal component of two first dominant empirical orthogonal (EOF) modes of the precipitation data. It is found that onset of summer rainy season (SRS), which is described by the EOF1, is in 6 May on the average, with a standard deviation of 13 days. Meanwhile, the autumn rainy season (ARS) indicated by the EOF2 has the climatological onset and standard deviation is 16 Sep and 12 days, respectively. The SRS starts simultaneously with the eastward shift of the Western North Pacific sub-tropical high (WPSH) and the evolution of summer monsoon westerlies. On the contrary, the retreat of summer monsoon over northern and central Indochina in boreal autumn indeed signifies the onset of ARS. The relationship between the onset and intraseasonal variations (ISVs): the 30?60-day (30?60DV) and the 10?20-day variation (10?20DV), are identified.

The results also insisted that ENSO has considerable influence on the onset of rainy season in the Indochina. In general, La Nina (EL Nino) years with warm (cold) sea surface temperature (SST) anomalies in the western Pacific and cold (warm) SST anomalies in the central?eastern Pacific in the preceding winter-spring have early (late) SRS onset. For an early onset year, the equatorial easterly winds are observed be stronger. Strong convective activities also occur over the southern Indochina Peninsula and the SCS in the preceding winter and spring. Whereas, the early onset of ARS is likely related to El Nino years with weaken equatorial easterly winds. It could be explained by the earlier retreat of westerlies monsoon and farther westward extension of the WPSH. Finally, the differences of ISV between early-late onset years of two rainy seasons are also discussed.

Keywords: monsoon onset, interannual variation, Indochina Peninsula, sub-tropical high, summer monsoon