Nonlinear Canonical Correlation Analysis between Rainfall data in Korea and East Asia Climate Index

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The Nonlinear Canonical Correlation Analysis (NLCCA) has been applied to analyze the East Asia sea surface temperature (SST) and sea level pressure (SLP) with Korea monthly precipitation, where the eight leading PCs of the SST, SLP and the eight PCs of the precipitation during 1973-2007 were inputs to an NLCCA model. The first NLCCA mode is plotted in the PC spaces of the Korea precipitation and the world SST present a curve linking the nonlinear relationship between the first three leading PCs of Korea precipitation and world SST forthright. The correlation coefficient between canonical variate time series u and v is 0.8057 and 0.8773 for the first NLCCA mode. And there are some areas' climate variability have higher relationship with Korea precipitation, especially focus on the north of East Sea' climate variability have represented the higher canonical correlation with Korea precipitation. Likewise in Korea, most stations display similarly uniform distributing characteristic and less difference, in particular the inshore stations have display identical distributing characteristic. In correlation variables' scores, the fluctuation and variation trend are also seasonal oscillation with high frequency.