Strong El Niño modes and their teleconnection patterns

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orrelation and the spatial distribution of interannual variability of precipitation, SST, and SSH are analyzed from the EOF and cross correlation method. All of the analyzed data are characterized into significant two modes explaining typical and strong El Niño signals and these two modes are highly correlated within the time lag of about 8 to 11 month.

Fig. 1 shows the time series of the principal components for precipitation. The first and second EOF mode account for 41.8% and 29.2% of the total variance, respectively. Amplitude of the first mode (dotted line) exhibits typical El Niño events. The variation in time of the second mode (solid line) particularly increases at the strong peak during the 1982-1983 and 1997-1998 El Niño periods. It also seems to exist significant time lag between the typical and strong EOF mode. The maximum value of the lagged correlation between the typical and strong mode reaches up to 0.47 with a time lag of 10 month and the second is 0.39 with a 71 month.

Distributions of eigenvectors of strong El Niño modes and lagged correlation map show possible teleconnection pattern of eastward migration of climate system in the Pacific area.

Understanding of strong El Niño modes and their lagged correlations will have potentially large impacts on the related studies about interannual variability and its teleconnection pattern in global climate system.

Key words : Strong El Niño, EOF, Cross correlation, Teleconnection

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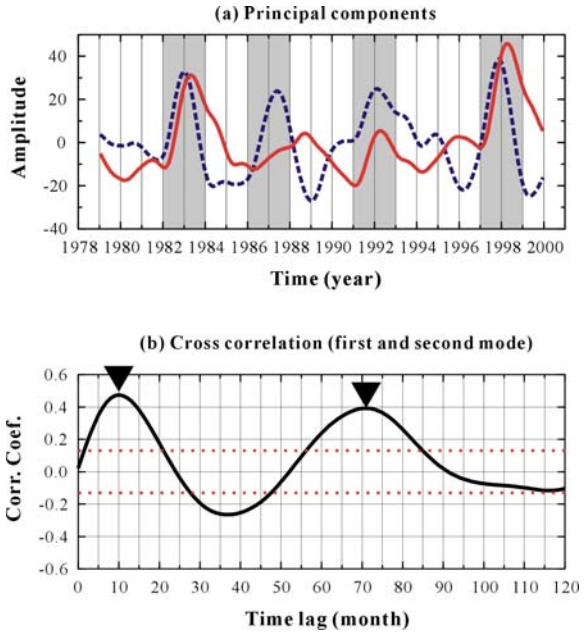

Fig. 1. (a) Time series of principal components of the first (dotted line) and the second (solid line) mode. (b) Cross correlation series between two modes with 95% confidence limits (dotted line). Shaded regions correspond with El Niño episodes and the inverted triangle marks are the first and second maximum correlation points.