



Intraseasonal tropical atmosphere variability associated to canonical and Modoki El Niños

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Recent studies has emphasized the existence of two types of El Niños: the canonical El Niño which is characterized by SST anomalies located in the eastern Pacific (EP) and so-called central Pacific (CP) El Niño (also called dateline El Niño, El Niño Modoki or warm pool El Niño) with anomalous SST shifted toward the dateline and cooler water located to the east and to the west. Recent studies suggest an increase of the frequency of occurrence of the CP El Niño, which could be due to change in mean state associated to global warming. Here we investigate the intraseasonal tropical variability (ITV) associated to two flavors of El Niño, considering that the former is tightly linked to the mean SST over the warm pool region and is seasonnaly phased looked with ENSO. Two main components of the ITV are considered, namely the Madden Julian Oscillation (MJO) and Equatorial Rossby wave (ER). Those are derived from wavenumber-frequency fourier decomposition and the consideration of the symmetric and asymmetric components of the signal in the frequency-wavenumber space.

From the composite analysis of ITV patterns filtered from NCEP/NCAR zonal wind at 850 hPa we point out three main properties of ITV behavior during EP and CP El Niño.

1. The timing of MJO and ER maximum in seasonal cycle is significantly different for two types of ENSO.
2. The magnitude of anomalies is much stronger during CP event which results from location of SST anomalies in the central Pacific which are located in a more favorable region for convection
3. The year following El Niño peak is characterized by stronger MJO and Rossby wave activity for CP event than for EP event. This is also related to the maintenance of the SST anomalies in the central Pacific during CP El Niños that favors the equatorial waves generation.

It is suggested that during EP El Niño, the MJO and equatorial Rossby waves act mostly during the developing phase of the event while during CP El Niño, they mostly participate to the persistence of the SST anomalies during the mature and decaying phases of the event